

# CITY OF PHILADELPHIA PENNSYLVANIA

OFFICE OF THE CONTROLLER

PHILADELPHIA FIRE DEPARTMENT

PFD Needs to Reconsider Its  
Brownout and Rotation Policies

February 2016

City Controller  
**Alan Butkovitz**



*Promoting honest, efficient & fully accountable government*



# CITY OF PHILADELPHIA

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February 5, 2016

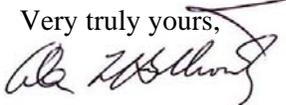
Derrick J.V. Sawyer, Commissioner  
Philadelphia Fire Department  
Fire Administration Building  
240 Spring Garden Street  
Philadelphia, PA 19123

Dear Commissioner Sawyer:

Pursuant to Section 6-400(d) of the Home Rule Charter and with the assistance of Robert C. Drennen, consultant and former Philadelphia Fire Department (PFD) battalion chief, the Office of the Controller conducted a performance audit of the PFD's fire emergency response times. Our objective was to determine the impact, if any, of your department's policies regarding "brownouts" and the rotation of firefighters. A synopsis of the results of our work, which was performed in accordance with *Government Auditing Standards*, is provided in the executive summary to the report.

We discussed our findings and recommendations with you and your staff at an exit conference and included your written response to our comments as part of the report. We believe that our recommendations, if implemented by management, will improve the operations of the PFD. Our recommendations have been numbered to facilitate tracking and follow-up in subsequent years.

We would like to express our thanks to you and your staff for the courtesy and cooperation displayed during the conduct of our work.

Very truly yours,  
  
ALAN BUTKOVITZ  
City Controller

cc: Honorable James F. Kenney, Mayor  
Honorable Darrell L. Clarke, President  
and Honorable Members of City Council  
Members of the Mayor's Cabinet



# PHILADELPHIA FIRE DEPARTMENT PFD NEEDS TO RECONSIDER ITS BROWNOUT AND ROTATION POLICIES

## EXECUTIVE SUMMARY

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### Why The Controller's Office Conducted The Audit

Pursuant to Section 6-400(d) of the Home Rule Charter, and with the assistance of Robert C. Drennen, consultant and former Philadelphia Fire Department (PFD) battalion chief, the Office of the Controller (Controller's Office) conducted a performance audit to assess the impact of the PFD's rolling "brownout" and "rotation" policies on response times to fire emergencies in the City of Philadelphia. More specifically, we studied the impact these two policies had on the ability of the PFD to meet the national standard for response, as set forth by the National Fire Protection Association (NFPA)<sup>1</sup> and adopted by the PFD.

### What The Controller's Office Found

Trends in Philadelphia response time data suggest that the PFD's decisions to implement a brownout policy as a way to cut overtime costs during tough economic times, and mandate a rotation schedule among firefighters to ensure all firefighters have equal opportunity to work in various assignments and acquire diverse skills, only exacerbated the department's already underachieving response to fire emergencies. While the NFPA standard calls for the first due fire engines to arrive on scene within 5 minutes and 20 seconds after being dispatched for 90 percent of their runs, the PFD has been unable to meet that target time. The department's best response occurred in 2008 at 82 percent of the runs, and through June 2015 it has continually lingered in the mid 70 percent range. The effects of the two policies, which have negatively impacted travel time to fires, have jeopardized public safety. Moreover, despite the PFD's assertions that the brownout policy would lead to reduced overtime costs of \$3.8 million, overtime for firefighters actually climbed from \$15.7 million in fiscal year 2010 to \$34.2 million in fiscal year 2014.

Other matters we observed during the audit included:

- PFD firefighters take significantly longer than recommended by the NFPA to suit up, get to the vehicle, board the vehicle, and safely secure themselves for travel (*turnout time*).
- The number of fire stations has not always kept pace with the City's development, which in turn has perhaps contributed to the department's inability to meet the NFPA standard for response.
- Data regarding on-scene arrival times in the PFD's CAD was sometimes incomplete and inaccurate, often when the fire incident involved a death or injury.

### What The Controller's Office Recommends

The Controller's Office has developed a number of recommendations to address the above findings. They include: (1) eliminate the Brownout and Firefighter Rotation policies; (2) investigate what may be causing poor turnout time for its engines and develop corrective action; (3) examine the coverage area of fire stations to determine if location is impeding quicker response to fire emergencies; and (4) investigate the cause of missing or inaccurate components of time in the CAD and develop corrective action.

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<sup>1</sup> NFPA 1710 - Standard for the Organization and Deployment of Fire Suppression Operations, and Special Operations to the Public by Career Fire Departments 2010 Edition. The 2010 edition of NFPA 1710 was approved as an American National Standard on June 15, 2009.

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### Background



The Philadelphia Fire Department's (PFD) mission is to provide efficient and effective fire protection, emergency rescue and emergency medical services to the citizens and visitors of Philadelphia. The PFD was established by the Philadelphia Home Rule Charter to perform the following functions: extinguish fires within the city and, upon the request of appropriate authorities, outside the city; administer the fire code relating to fire and explosive hazards; institute and conduct programs of public education in fire prevention and safety; train, equip, maintain, supervise and discipline an adequate number of fire fighters; and operate a fire alarm system. The PFD consists of four major divisions that include Emergency Medical Services, Operations, Technical Services, and Administrative Services. Each of these divisions has the responsibility for carrying out the various functions of emergency medical services and fire fighting. A fire commissioner, who is appointed by the city's managing director, and four deputy commissioners manage the department.

### Overview and Demographics

The City of Philadelphia covers a 134 square mile area in Southeastern Pennsylvania. It has a nighttime population of 1.5 million people and a daytime population of 1.6 million. According to the PFD, excluding first responder runs, engine companies respond on average to about 1,500 calls a year. At the end of fiscal 2015, the number of PFD firefighters totaled 1,790. This is a decrease from 2,039 in fiscal 2008.

Philadelphia's fire suppression services are delivered from 63 locations throughout the City of Philadelphia. The fire stations are staffed with a variety of equipment including pumpers, ladders, and medic units. An engine company consists of one officer and three firefighters assigned to an apparatus equipped with a water pump, fire hose and other tools related to fire extinguishment. One of the three firefighters on every engine must be an Emergency Medical Technician. This requirement assures that each engine company responding to a fire is staffed by an individual capable of applying life preserving measures, if necessary, until more advanced medical assistance arrives. Ladder companies are staffed by one officer and four firefighters. The primary objectives of a ladder company are search and rescue operations. All ladder companies are equipped with the Jaws of Life extrication device. As is the case with engine companies, at least one firefighter must be an EMT.

### Fire Engine Locations

As indicated above, the PFD currently has 63 fire stations. The locations of the fire stations are presented in Table 1 below. Nearly 35 percent of the

Table 1: Fire Stations by District

| District/Location   | Engine | Ladder |
|---|--------|--------|
| Center City/South Broad Street                              |        | 5      |
| North Philadelphia (Lower)/2426-32 N 2 <sup>nd</sup> Street | 2      | 3      |
| South Philadelphia/200-10 Washington Avenue                 | 3      |        |
| West Philadelphia/4221-29 Market Street                     | 5      | 6      |
| Kensington & Richmond/2601 Belgrade Street                  |        | 16     |
| Kensington & Richmond/3780 Kensington Avenue                | 7      | 10     |
| Center City/101-15 N. 4 <sup>th</sup> Street                |        | 2      |
| Germantown & Chestnut Hill/6900 Germantown Avenue           | 9      | 21     |
| South Philadelphia/1357 S. 12 <sup>th</sup> Street          | 10     |        |
| Center City/601-09 South Street                             | 11     |        |
| Roxborough & Manayunk/4445 Main Street                      | 12     |        |
| North Philadelphia (Lower)/1541-47 Parrish Street           | 13     |        |
| Near Northeast/1652-54 Foulkrod Street                      |        | 15     |
| West Philadelphia/1517-19 Belmont Avenue                    | 16     |        |
| Near Northeast/8205 Roosevelt Boulevard                     | 18     |        |
| Germantown & Chestnut Hill/302-10 E Cheltenham Avenue       | 19     | 8      |
| Center City/133 N. 10 <sup>th</sup> Street                  | 20     | 23     |
| Far Northeast/3270 Comly Road                               | 22     | 31     |
| South Philadelphia/1200 S 20 <sup>th</sup> Street           | 24     |        |
| Kensington & Richmond/2937 Boudinot Street                  | 25     |        |
| North Philadelphia (Lower)/1901-15 Oxford Street            | 27     |        |
| Kensington & Richmond/2520 E. Ontario Street                | 28     |        |
| North Philadelphia (Lower)/400-08 W. Girard Avenue          | 29     |        |
| Kensington & Richmond/4750 Richmond Street                  | 33     |        |
| North Philadelphia (Lower)/1301 N. 28 <sup>th</sup> Street  | 34     |        |
| Germantown & Chestnut Hill/4208 Ridge Avenue                | 35     | 25     |
| Near Northeast/7818 Frankford Avenue                        | 36     | 20     |
| Germantown & Chestnut Hill/101 W Highland Avenue            | 37     |        |
| Near Northeast/6601 Keystone Street                         | 38     |        |
| Roxborough & Manayunk/6630 Ridge Avenue                     |        | 30     |
| Southwest/2201 S. 65 <sup>th</sup> Street                   | 40     | 4      |
| West Philadelphia/1201 N. 61 <sup>st</sup> Street           | 41     | 24     |
| Center City/2110 Market Street                              | 43     | 9      |
| West Philadelphia/3420 Haverford Avenue                     | 44     |        |
| North Philadelphia (Lower)/2401 N. 26 <sup>th</sup> Street  | 45     | 14     |
| Far Northeast/9197 Frankford Avenue                         | 46     |        |
| South Philadelphia/3031 Grays Ferry Avenue                  | 47     |        |
| South Philadelphia/2612 S. 13 <sup>th</sup> Street          | 49     |        |
| North Philadelphia (Upper)/1325 W. Cambria Street           | 50     | 12     |
| Olney/5931 Old York Road                                    | 51     | 29     |
| Near Northeast/4501 Van Kirk Street                         | 52     |        |
| South Philadelphia/400 Snyder Avenue                        | 53     | 27     |
| West Philadelphia/1923 N. 63 <sup>rd</sup> Street           | 54     |        |
| North Philadelphia (Upper)/101 W. Luzerne Street            | 55     | 22     |
| Near Northeast/834 Rhawn Street                             | 56     |        |
| West Philadelphia/5559 Chestnut Street                      | 57     |        |
| Far Northeast/812 Hendrix Street                            | 58     |        |
| North Philadelphia (Upper)/2207 W Hunting Park Avenue       | 59     | 18     |
| South Philadelphia/2301 S 24 <sup>th</sup> Street           | 60     | 19     |

Table 1: Fire Stations by District (continued)

| District/Location                                     | Engine | Ladder |
|---|--------|--------|
| Olney/5334 Rising Sun Avenue                          | 61     |        |
| Far Northeast/9845 Bustleton Avenue                   | 62     | 34     |
| Olney/1224 Oak Lane Avenue                            | 63     |        |
| Near Northeast/6100 Rising Sun Avenue                 | 64     |        |
| Roxborough & Manayunk/7720 Ridge Avenue               | 66     |        |
| Southwest/801 S. 52 <sup>nd</sup> Street              | 68     | 13     |
| Southwest/8201 Tincum Avenue                          | 69     |        |
| Near Northeast/4800 Langdon Street                    | 70     |        |
| Near Northeast/1900 Cottman Avenue                    | 71     | 28     |
| Olney/1127 W. Loudon Street                           | 72     |        |
| Olney/7515 Ogontz Avenue                              | 73     |        |
| Southwest/13 Hog Island Road                          | 78     |        |
| South Philadelphia/Delaware & Washington Avenues      | MU1    |        |
| South Philadelphia/Passyunk Avenue & Schuylkill River | MU2    |        |

Source: Prepared by the Office of the Controller based on information provided by the PFD

fire stations are comprised of both an engine and a ladder company, while the remainder are comprised of one or the other of these firefighting apparatuses.

### Administration

Four Deputy Commissioners supervise and command the divisions of the PFD, which include: Operations, Technical Services, Administrative Services and Emergency Medical Operations. A Deputy Fire Commissioner of Operations commands the PFD's Fire Suppression and Special Operations Divisions, the Fire Academy, the Safety Office, and the Aviation Operations Division. The Fire Suppression Division has two Division Chiefs who are each responsible for overseeing the fire department operations for one half of the City of Philadelphia. Division 1 consists of 5 battalions and 29 fire stations<sup>2</sup>, while Division 2 has 6 battalions and 34 fire stations. A Deputy Fire Commissioner of Technical Services commands the PFD's Fire Communications, Fire Prevention, Fire Code, Fire Marshal, and Technical Support Divisions. A Deputy Fire Commissioner of Administrative Services commands the PFD's Fiscal, Human Resources, Information Technology, Information Services, Computer Services, and Facilities Maintenance Divisions. Finally, a Deputy Commissioner of Emergency Medical Services commands Emergency Medical Services Operations and the EMS Regional Office.

### Demand for Fire Suppression Services

The Operations Division responds to all calls for fire emergencies. Such emergencies account for 16 percent of all incidents (fire and medical) to which the PFD has responded in recent years. As depicted in Figure 1

<sup>2</sup> This includes the two Marine Units in South Philadelphia.

below, while in some years there has been less demand in fire services, overall from 2008 to 2015 it has increased nearly 6 percent.

**Figure 1: Annual Number of Fire Responses**



\*2015 total is projected by doubling the amount of calls during the first half of the year.

Source: Prepared by the City Controller's Office based on the PFD's Computer Aided Dispatch System.

### **Fire Call/Dispatch Procedures**

Individuals in need of emergency assistance dial the 911 center, which is located at police headquarters. All calls for fire or emergency medical services are immediately transferred to the Fire Communications Center (FCC) at the Fire Administration Building. The FCC is responsible for processing and dispatching all phone requests for fire and medical assistance. Once a 9-1-1 call is received by the FCC, a call-taker there identifies the call as either a fire emergency or a medical emergency. When a call is classified as a fire emergency, FCC call takers make inquiries using established protocol. Such inquiries include: asking the caller's location; determining the nature of the fire; determining the type of structure on fire; and inquiring if and where there are civilians trapped inside a building or dwelling.

While call-takers remain on the line to gather additional information, they electronically log the incident for dispatch into the FCC Computer Assisted Dispatch (CAD) System. Each incident is assigned a minimum initial dispatch assignment such as "Engine", "Tactical Box", or "Full Box".

### **PFD Implemented a Brownout Policy**

On August 2, 2010, the PFD implemented its controversial rolling "brownout" policy. In general, a brownout involves taking an engine or ladder company out of service temporarily and re-distributing the staff. In Philadelphia, every week three engine companies close during the day shift

and two engine companies and one ladder close during the night shift. PFD management has asserted this temporary re-distribution of staff is done for either training purposes or to fill in personnel gaps in other companies.

Management also stated the brownout policy would reduce overtime costs. It rationalized that when there had been a need for personnel in other fire companies, the PFD would call firefighters into work and pay them overtime. PFD management indicated that brownouts would allow the department to redistribute its personnel and pay everyone with “straight time” (normal shift pay), thus reducing the need for overtime and saving the city an estimated \$3.8 million in the general fund budget.

Since its inception, the PFD’s brownout policy has continued to be the subject of enormous controversy. Not long after its implementation, the media reported that after two children perished in a fire within the city’s Olney section, a union official questioned whether Philadelphia’s brownout policy contributed to their deaths.<sup>3</sup> And during the most recent PFD budget hearings in April 2015, brownouts dominated the Fire Commissioner’s discussion with City Council.

#### **PFD Established a Rotation Policy**

Beginning February 2013, the PFD instituted a second very controversial policy — its Firefighter Rotation Policy.<sup>4</sup> This policy imposed involuntary transfers of senior firefighters to other fire stations. As adopted, it was meant to “...ensure that all firefighters have equal opportunity to work in various assignments and acquire diverse skills.” PFD management also asserted that the rotation of firefighters “...will enhance their ability to achieve greater opportunities to facilitate upward mobility through the ranks, if desired.” Additionally, the policy indicated that “...by ensuring that all firefighters serve at least one rotation in the busiest battalions during their career, the on-the-job training that results from experience is more likely to occur.

As with the brownout policy, the department’s decision to impose mandatory transfers among firefighters was greeted with opposition and skepticism. The media reported that both firefighters and members of City

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<sup>3</sup>Melwert, Jim. “Firefighter Union Official Questions ‘Brownout’ Role in Fatal Olney Fire.” *CBS Philly*, February 23, 2011 <http://philadelphia.cbslocal.com/2011/02/23/firefighter-union-offical-questions-brownout-role-in-fatal-olney-fire/>

<sup>4</sup> The Firefighter Rotation Policy was adopted with the PFD’s General Memorandum # 12-134 issued November 1, 2012 to take effect in 2013.

Council were critical of the policy.<sup>5</sup> They viewed the policy as punitive because of a long-running contract dispute the firefighters were having with the administration at the time PFD management rolled out the policy. Moreover, as the media reported, “Critics on Council fear the transfers will break up effective firefighting teams, remove firefighting expertise from neighborhoods and threaten the traditional ‘family’ culture that’s part of an effective fire station.” In brief, many critics believed the policy would have a detrimental effect on public safety.

### **Purpose of the Audit**

Because of the controversy surrounding the PFD’s brownout and rotation policies, and more importantly, the potential consequences of these policies on public safety, the Office of the Controller (Controller’s Office) believed it necessary to assess the impact of these policies on the PFD’s response times to fire emergencies. Accordingly, pursuant to Section 6-400(d) of the Home Rule Charter, we conducted this audit to determine the need for recommendations regarding these policies.

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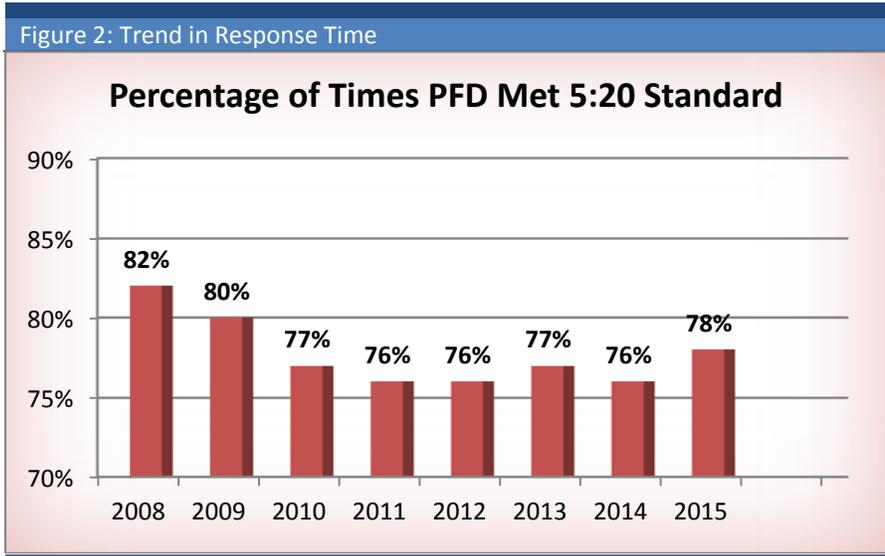
<sup>5</sup> Graham, Troy. “Rotation Policy Under Fire.” *The Inquirer*, October, 17, 2013.  
<http://www.philly.com/philly/blogs/heardinthehall/Rotation-Policy-Under-Fire.html>

**PFD’s Brownout and Rotation Policies Have Negatively Impacted Fire Response**

Trends in Philadelphia response time data suggest that the PFD’s decisions to implement a brownout policy as a way to cut overtime costs during tough economic times, and mandate a rotation schedule among firefighters to ensure all firefighters have equal opportunity to work in various assignments and acquire diverse skills, only exacerbated the department’s already underachieving response to fire emergencies. The effects of these two policies, which have negatively impacted travel time to fires, have jeopardized public safety, and may have contributed to the actual loss of lives. Moreover, despite the PFD’s assertions that the brownout policy would lead to reduced overtime costs, in reality, the opposite occurred.

**Historical Trend Shows PFD Has Fallen Short of the National Standard for Fire Response**

Although the PFD asserts that its fire emergency response — from dispatch to on-scene arrival time — fell below the national standard established by the National Fire Protection Association (NFPA)<sup>6</sup> and adopted by the department, our analysis of the data going as far back as 2008 shows otherwise. While the NFPA standard calls for first due fire engines to arrive on scene within 5 minutes and 20 seconds after being dispatched for 90 percent of their runs, the PFD has been unable to meet that target time. Its best response occurred in 2008 at 82 percent of the runs. However, as Figure 2 illustrates, since 2008 the response rate dropped to its lowest rate



\* 2015 data represents the first six months of the calendar year.  
 Source: Prepared by the office of the Controller based on PFD’s CAD data.

<sup>6</sup> In response to a direct inquiry from the Office of the Controller to the National Fire Protection Association regarding what types of fire incidents are covered by NFPA 1710, the NFPA responded that the standard applies to any incident where a fire apparatus (fire engine) is responding. According to NFPA 1710, “This standard applies to the deployment of resources by a fire department to emergency situations when operations can be implemented to save lives and property.” An “emergency incident” as defined by NFPA 1710 is “any situation to which an emergency services organization responds to deliver emergency services including rescue, fire suppression, emergency medical care, special operations, law enforcement, and other forms of hazard control and mitigation.” “Special Operations” as defined by NFPA 1710 are “those emergency incidents to which the fire department responds that require specific and advanced training and specialized tools and equipment.”

of 76 percent after the PFD adopted the brownout policy in August 2010.

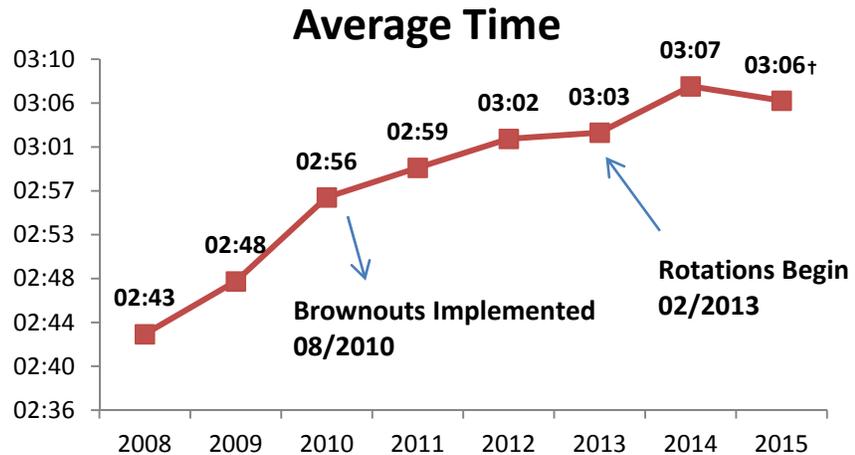
The above chart represents more than 242,000 fire incidents that occurred between calendar years 2008 through the first half of June 2015. For almost 54,000 of these incidents, it took the PFD over 5 minutes 20 seconds for a fire engine to arrive on scene after receiving a dispatch from the FCC. Of these incidents, close to 751 of them took 8 minutes or longer to reach the fire scene.

Travel Time Has Been Increasing

A major component of fire response is *travel time*, that is, the time it takes an engine to travel from the fire station to the scene of a fire. It is the time an engine leaves the fire station, navigates through the streets and finally arrives at the emergency. Four minutes is considered the time it should take the first arriving engine to travel to the scene of an emergency and it should be accomplished for 90 percent of all fire operations.<sup>7</sup>

Analyses of travel time over the nearly eight-year period (Figure 3 below) showed that on *average* it has been on an upward trend. In 2008, for the PFD’s nearly 32,000 fire runs that year, it took firefighters an *average* of 2:43 to arrive on scene. When the PFD introduced the brownout policy in August 2010, *average* travel time jumped 8 percent to 2:56. After the forced rotation began in 2013, *average* travel time increased even further to 3:07 the following year. Over the nearly eight-year period PFD average travel time has risen over 14 percent.

Figure 3: Increasing Trend of Travel Times



† Projected for 2015.

Source: Prepared by the Office of the Controller from the PFD’s CAD database.

Our analysis of the CAD data shows that even before implementation of the brownout and rotation policies, the PFD had not been meeting the four

<sup>7</sup> See NFPA 1710: Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations and Special Operations to the Public by Career Fire Departments, (NFPA 1710).

minute, 90 percent mark for any of the years we examined. For example, in 2008, fire engines arrived on the scene within four minutes for only 86 percent of the calls to which they were dispatched. The rate dropped two percent in 2009 to 84 percent, and by 2010, the year the PFD introduced the brownout policy, the ability of firefighters to arrive on-scene within four minutes dropped to 81 percent. Thereafter, the percentage of incidents for which the PFD arrived within four minutes dropped to 80 percent, where it stabilized until dropping to 77 percent a year after the adoption of the rotation policy. As discussed in a later section of this report, for many fire stations the area of coverage may be a contributing factor to the inability of firefighters to reach the emergency scene timely.

Public Safety Is  
Being  
Jeopardized

When the PFD temporarily closes a fire station, it leaves a gap in coverage, thus increasing the distance a responding engine must travel. This can add minutes to the response time when a matter of seconds could mean the difference between life and death.

The Insurance Services Office (ISO) states that a fire engine should travel no more than 1.5 road miles to reach the scene of a fire.<sup>8</sup> The ISO's formula as shown below, considers the average speed for a fire apparatus responding with emergency lights and siren at thirty-five miles per hour. That speed considers average terrain, average traffic, weather, and slowing down for intersections.

$$Time = 0.65 + 1.7(Distance)$$

*.65 = a vehicle-acceleration constant for the first .05 mile traveled*  
*1.7 = a vehicle-speed constant validated for response distances ranging from .5 miles to 8.0 miles*

Adapting the above formula to the NFPA travel time standard of four minutes, we calculated a travel distance benchmark as two road miles for the maximum distance in which a first responding engine should arrive on scene.

$$.65 + (1.7 \times 2 \text{ miles}) = \text{four minutes 3 seconds}$$

**Brownouts Have Compromised Coverage for High Hazard Areas**

When a fire station is temporarily closed, surrounding station fire engines must travel greater distances leading to longer response times. Using the two-mile benchmark we analyzed the distance that perimeter fire engines would have to travel when covering for a browned-out fire station. We did this for a sample of fire districts throughout the city, where there was at

<sup>8</sup> The Insurance Service Office (ISO) is a leading source of information about property/casualty risk. Per the Fire Chiefs Online website, the ISO evaluates municipal fire-protection efforts in communities throughout the United States <https://firechief.iso.com/FCWWeb/mitigation/ppc/3000/ppc3015.jspl>.

Table 2: Estimated Travel Time and Distance of Perimeter Fire Engines to Cover Brownd-Out Fire Stations

| Brownout Closures of Fire Companies |                         |  |                       |   |                       |                                  |                       |   |                       |
|-------------------------------------|-------------------------|--|-----------------------|---|-----------------------|----------------------------------|-----------------------|---|-----------------------|
| Brownout Engine Company             | Covering Engine Company | Target Hazard                              |                       |   |                       |                                  |                       |   |                       |
|                                     |                         | Nazareth Hospital                          |                       | Holy Family Nursing Home                  |                       | Wesley Enhanced Living           |                       | Wills Eye Surgical Center               |                       |
|                                     |                         | Response Distance                          | Estimated Travel Time | Response Distance                         | Estimated Travel Time | Response Distance                | Estimated Travel Time | Response Distance                       | Estimated Travel Time |
| Engine 18                           | Engine 46               | 2.4  | 4:44                  | 2.7                                       | 5:14                  | 2.7                              | 5:14                  | 3.2                                     | 6:04                  |
|                                     | Engine 36               | 1.9  | 3:53                  | 2.2                                       | 4:23                  | 2.2                              | 4:23                  | 3.4                                     | 6:26                  |
|                                     | Engine 71               | 1.9  | 3:53                  | 2.1                                       | 4:13                  | 2.2                              | 4:23                  | 3.5                                     | 6:36                  |
|                                     | Engine 56               | 2.3  | 4:34                  | 2.5                                       | 4:54                  | 2.5                              | 4:54                  | 3.5                                     | 6:36                  |
|                                     | Engine 62               | 2.8  | 5:25                  | 2.8                                       | 5:25                  | 2.9                              | 5:35                  | 2.2                                     | 4:23                  |
|                                     |                         | St. Joseph's High School                   |                       | Saint Joseph's Hospital                   |                       | AME Union Church                 |                       | Gesu School                             |                       |
| Engine 27                           | Engine 29               | 1.3  | 2:52                  | 1.2                                       | 2:41                  | 1.4                              | 3:02                  | 1.5                                     | 3:12                  |
|                                     | Engine 34               | 1.1  | 2:31                  | 1.1                                       | 2:31                  | 1.2                              | 2:41                  | 1                                       | 2:21                  |
|                                     | Engine 43               | 1.7  | 3:32                  | 1.8                                       | 3:43                  | 2.1                              | 4:13                  | 1.9                                     | 3:53                  |
|                                     | Engine 45               | 1.9  | 3:53                  | 2   | 4:03                  | 1.6                              | 3:22                  | 1.7                                     | 3:32                  |
|                                     |                         | St. Vincent Home for Orphans               |                       | Industrial Complex                        |                       | Marjam Supply Co.                |                       | Orthodox Auto Co.                       |                       |
| Engine 38                           | Engine 36               | 1.9  | 3:53                  | 2.1                                       | 4:13                  | 2                                | 4:03                  | 2.4                                     | 4:44                  |
|                                     | Engine 52               | 2.1  | 4:13                  | 1.6                                       | 3:22                  | 1.8                              | 3:43                  | 1.7                                     | 3:32                  |
|                                     | Engine 33               | 3  | 5:45                  | 2.5                                       | 4:54                  | 2.7                              | 5:14                  | 2.6                                     | 5:04                  |
|                                     | Engine 46               | 3  | 5:45                  | 3.5                                       | 6:36                  | 3.3                              | 6:16                  | 3.8                                     | 7:07                  |
|                                     |                         | West Philadelphia Achievement School       |                       | Saint Donato School                       |                       | Lamberton Elementary School      |                       | Congregation Beth Yeshua Synagogue      |                       |
| Engine 41                           | Engine 54               | 1.3  | 2:52                  | 1.1                                       | 2:31                  | 1.6                              | 3:22                  | 1.6                                     | 3:22                  |
|                                     | Engine 57               | 1.9  | 3:53                  | 1.7                                       | 3:32                  | 2.9                              | 5:35                  | 3.0                                     | 5:45                  |
|                                     | Engine 16               | 2.6  | 5:04                  | 2.3                                       | 4:34                  | 3.2                              | 6:04                  | 3.4                                     | 6:26                  |
|                                     | Engine 68               | 3.1  | 5:55                  | 2.9                                       | 5:35                  | 4.0                              | 7:27                  | 4.2                                     | 7:47                  |
|                                     |                         | AMTRAK Station                             |                       | State of Pennsylvania Parole Board        |                       | KIPP Philadelphia Charter School |                       | Mastery Charter School-Clymer Campus    |                       |
| Engine 50                           | Engine 59               | 1.6  | 3:22                  | 2.2                                       | 4:23                  | 2                                | 4:03                  | 2                                       | 4:03                  |
|                                     | Engine 45               | 1.4  | 3:02                  |   |                       |                                  |                       |   |                       |
|                                     | Engine 55               | 2  | 4:03                  | 2.3                                       | 4:34                  | 2.4                              | 4:44                  | 2.2                                     | 4:23                  |
|                                     | Engine 72               | 2.3  | 4:34                  |   |                       |                                  |                       |   |                       |
|                                     | Engine 2                |  |                       | 1.2                                       | 2:41                  | 1.4                              | 3:02                  | 1.4                                     | 3:02                  |
|                                     | Engine 27               |  |                       | 2   | 4:03                  | 2                                | 4:03                  | 2.3                                     | 4:34                  |
|                                     |                         | Central High School                        |                       | Pennell School                            |                       | High Rise Residential Building   |                       | Germantown Evangelical Academy          |                       |
| Engine 51                           | Engine 72               | 1.4  | 3:02                  | 1.7                                       | 3:32                  | 1.3                              | 2:52                  | 1.2                                     | 2:41                  |
|                                     | Engine 19               | 1.4  | 3:02                  | 1.5                                       | 3:12                  | 1.4                              | 3:02                  | 1.5                                     | 3:12                  |
|                                     | Engine 63               | 1.6  | 3:22                  | 1.5                                       | 3:12                  | 1.6                              | 3:22                  | 1.7                                     | 3:32                  |
|                                     | Engine 61               | 1.9  | 3:53                  |   |                       | 1.9                              | 3:53                  | 1.9                                     | 3:53                  |
|                                     | Engine 73               |  |                       | 2   | 4:03                  |                                  |                       |   |                       |
|                                     |                         | Roberto Clemente Middle School             |                       | Saint Christopher's Hospital for Children |                       | Thomas Edison High School        |                       | Brightside Academy                      |                       |
| Engine 55                           | Engine 7                | 2.1  | 4:13                  | 1.6                                       | 3:22                  | 1.9                              | 3:53                  | 1.7                                     | 3:32                  |
|                                     | Engine 50               | 1.5  | 3:12                  | 1.8                                       | 3:43                  | 1.8                              | 3:43                  | 1.7                                     | 3:32                  |
|                                     | Engine 2                | 2  | 4:03                  | 2.1                                       | 4:13                  |                                  |                       |   |                       |
|                                     | Engine 61               | 2  | 4:03                  | 1.9                                       | 3:53                  | 1.7                              | 3:32                  | 1.8                                     | 3:43                  |
|                                     | Engine 72               |  |                       |   |                       | 1.7                              | 3:32                  | 2.2                                     | 4:23                  |
|                                     |                         | Cheltenham Nursing & Rehabilitation Center |                       | Treeview Manor Apartments                 |                       | Garden Apartment Complex         |                       | St. Jude Syro Malankara Catholic Church |                       |
| Engine 63                           | Engine 51               | 1.7  | 3:32                  | 1.5                                       | 3:12                  | 1.9                              | 3:53                  | 1.8                                     | 3:43                  |
|                                     | Engine 73               | 2  | 4:03                  | 2.3                                       | 4:34                  | 2.4                              | 4:44                  | 2.4                                     | 4:44                  |
|                                     | Engine 61               | 2.6  | 5:04                  | 2   | 4:03                  | 2.1                              | 4:13                  | 2                                       | 4:03                  |
|                                     | Engine 64               | 2.6  | 5:04                  | 2.3                                       | 4:34                  | 2.3                              | 4:34                  | 2.2                                     | 4:23                  |

Note: Response distance is measured in miles and travel time is measured in minutes.

Source: Office of the Controller analysis

least one "high-hazard" occupancy<sup>9</sup> requiring a distance of more than two miles<sup>10</sup> for the first-due engine to cover in a browned-out engine's district.

Table 2 above illustrates examples of districts in the city, where there are high hazard occupancies that include hospitals, schools and nursing homes, in which the perimeter engine of a browned-out engine's district might find it difficult to arrive on scene within the established benchmark of four minutes. For example, when Engine 18 is browned-out, half of the perimeter engines are over two miles from the selected hazards. Therefore, it will be extremely difficult for those engines to arrive on scene within four minutes.

Each company browned-out, as illustrated in the table above, results in a company responding from a greater distance, thus increasing the response time. Delays in response time can lead to more dangerous fires than would be encountered without the brownouts, ultimately increasing the risks for more injuries and possible deaths to firefighters and civilians.

#### **Forced Rotation of Firefighters Could Lead to Inexperienced Responses**

It is very important that firefighters become knowledgeable about the local districts in which they are assigned to fight fires. For example, they must become familiar with the types of structures and dwellings in the district; they must learn the location of high hazard occupancy; and they must become acquainted with neighborhood roads and highways they will navigate to reach fire emergencies. Not only must they be knowledgeable about their own districts, it is incumbent upon them to become familiar with those same aspects in surrounding districts where they may be dispatched as second due in or have to provide brownout coverage.

To gain an understanding of how the rotations affected fire companies throughout the city, we reviewed PFD's list of planned rotations for each year the policy has been in place. We noted thirty-nine fire companies where there were three or more firefighters from one platoon scheduled to be rotated. In addition, the Controller's Office found three extreme cases at Engine 5, Ladder 6 and Ladder 14, where four firefighters on each platoon were on the rotation list. This could prove disastrous since their replacements may not know the local district and work as a full crew for a tour of duty. And, as discussed earlier and depicted in Figure 3, we observed travel time for fire engines increasing since rotations occurred.

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<sup>9</sup> A high-hazard occupancy is defined as an occupancy that presents a high life hazard or large fire potential due to its construction, configuration, or the presence of specific materials, processes or contents.

<sup>10</sup> Using Google Maps, we determined the shortest routes by road miles from the covering districts to the identified high-hazard occupancy.

Slower Travel Time May Have Contributed to Incidents Involving Death and Injuries

Slower travel times would suggest a higher risk for injury and loss of lives. In recent years, several media accounts, which we have confirmed, have reported that fire engines took a very long time to arrive on scene. In the incidents described below, the closest engine was temporarily closed due to being browned-out. These fires resulted in both firefighter and civilian injuries, as well as civilian deaths. No one can say for sure whether these deaths or injuries may have been prevented with a quicker response. However, in general, the severity of a fire can be controlled when an engine arrives on scene in the least amount of time. It is important to note that for most of these specific incidents, the on-scene arrival time of the engines were missing from the CAD database.

- On August 7, 2010, five days after the brownout became effective, a 12-year-old autistic child died in a West Philadelphia row house fire. Engine 57, which is two tenths of a mile from the scene of the fire, was unfortunately browned-out. Therefore, the first due engine became Engine 68 which is 1.2 miles from the fire scene. The media reported that witnesses did not believe the engine arrived timely. A review of the incident in the CAD shows the on-scene time for Engine 68 was missing from the system.
- On February 22, 2011, two children — a 7-year-old and a 9-year-old — were killed in a house fire in the city’s Olney section. In addition to the two fatalities, eight other victims were injured – four children and four adults. The local district is covered by Engine 61 which is only 1.2 miles from the fire scene. Because Engine 61 was browned-out, Engine 51, located 1.6 miles from the scene became the first-due-in engine. Review of the incident in the CAD revealed Engine 51’s on-scene time was missing from the system.
- On February 16, 2014 an elderly woman was killed in a West Philadelphia house fire. Engine 41, which is .5 miles from the scene of the fire, would have been the first on-scene, but unfortunately Engine 41 had been dispatched on a medical emergency call. Engine 57 was the next closest engine company, but Engine 57 was browned-out the day of the fire. Therefore, the first and second due engines were Engine 16 and Engine 54, respectively. Subsequently, after the initial dispatch, Engine 68 was also sent. Although there was no conclusive evidence as to whether Engine 16, Engine 54 or Engine 68 arrived first on location, the on-scene times for all responding engines were missing in the CAD system.
- On October 08, 2014 three firefighters were injured in a house fire in the city’s Tacony section. Engine 38 which is .6 miles from the scene of the fire was browned-out. Therefore, the first due engine

became Engine 36 which is 1.3 miles from the scene. Engine 36 arrived on scene in three minutes and 16 seconds beating the national benchmark. However, Engine 38 would have arrived in under half the time, possibly preventing the injuries from occurring.



Source: Philadelphia Fire Department

Perhaps one of the most egregious cases of slow response was a fire incident that occurred during December 2014 involving the death of a Philadelphia firefighter. And although the incident concerned a ladder company, which fell outside the scope of this audit, the Controller's Office is discussing it here to highlight the importance for any type of firefighting equipment to arrive timely on the scene.

The primary objectives of ladder companies are search and rescue.<sup>11</sup> Ladder company crews are also responsible for removing heat, smoke and gases to allow greater visibility. On December 9, 2014 at approximately 2:50 am, a fire was reported at 1655 Middleton Street in the West Oak Lane section of the city. The PFD promptly dispatched two engines, two ladders, and one Battalion Chief (Engine 73, Engine 63, Ladder 8, Ladder 21, and Battalion 2). Within four minutes of being dispatched, Engine 73 arrived on scene and began fire fighting operations. Approximately nine minutes after dispatch, Command<sup>12</sup> attempted to raise Ladder 8 with no response. A second attempt was made a minute later with no response. After the third attempt, Ladder 8 acknowledged command over ten minutes after the initial dispatch. Command notified Ladder 8's officer they had "to get this place ventilated for the first-in engine",<sup>13</sup> but it was not until approximately 14 minutes after being dispatched that Ladder 8 notified command that they were stuck behind a car. Unfortunately, Ladder 8 did not arrive on scene until over eighteen minutes after they were dispatched to the fire. A firefighter who died in the fire was found at approximately 3:15 am.

According to an internal critique of the December 9th fire, several key issues were identified including inadequate ventilation in the house, delays in getting ladder trucks to the fire, and poor communications at the scene. Per the internal critique, "Ventilation on the fire-ground is done for two important reasons: to assist firefighters with tactical operations (venting for fire) or to assist trapped civilians during rescue operations (venting for life)... Ventilation creates an environment more survivable for both

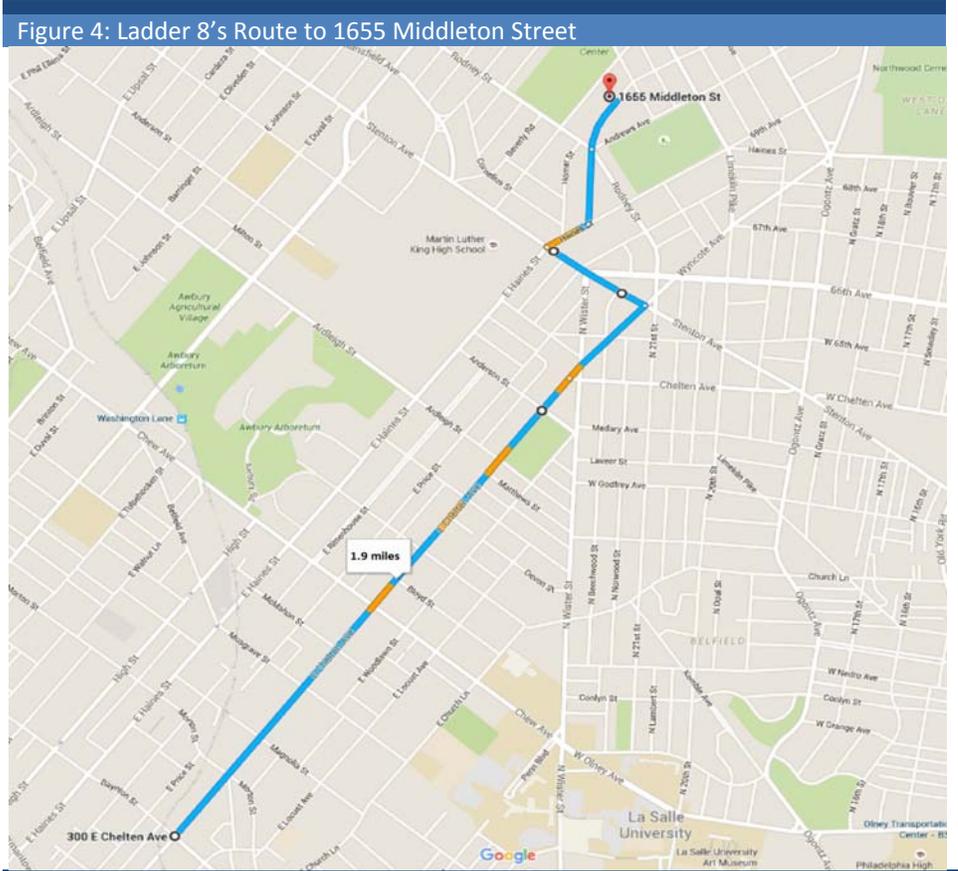
<sup>11</sup> See the PFD's website: [http://www.phila.gov/fire/units\\_and\\_services/units\\_operations\\_abate\\_vehicles.html](http://www.phila.gov/fire/units_and_services/units_operations_abate_vehicles.html).

<sup>12</sup> Per the PFD's Operations Procedure #19, the term "Command" or "Incident Commander" means the person responsible for the overall management of all incident activities including the development and implementation of strategy. When the incident commander attempts to raise a unit, he/she is attempting to communicate through radio with the unit. The lack of response prevents the incident commander's ability to properly manage the fire scene.

<sup>13</sup> Based on the PFD's Fire Communications Center's recordings of the fire on December 9, 2014 at 1655 Middleton Street.

victims and firefighters. It reduces the environmental impact our firefighters have to operate in and will accelerate their ability to facilitate fire control and extinguishment.... If civilians are trapped inside, or firefighters are operating inside, then lifting the heat and smoke even a couple inches may mean the difference between achieving or not achieving the overall objectives."<sup>14</sup> Ladder 8’s late arrival delayed the start of much needed ventilation.

A review of Ladder 8’s 1.9 mile route from the fire station located at 300 East Cheltenham Avenue to the scene of the fire at 1655 Middleton Street indicates much of the route is a straight line (see Figure 4 below). Based on the distance to be traveled, we estimate that Ladder 8 should have arrived at the fire within four minutes of leaving the fire station.<sup>15</sup> PFD records show that the on-scene arrival of Ladder 8 was eighteen minutes, 27 seconds, which was over ten minutes above the 8 minute recommended time.



Source: Google Maps

At the time this report was being drafted, PFD had yet to release to us, or make public, its Line of Duty Death (LODD) Report regarding the 1655

<sup>14</sup> Philadelphia Fire Department “After Action Report” for 1655 Middleton Street, Richard Davison, MS, MBA, Deputy Fire Chief.

<sup>15</sup> Estimated Response Time= 0.65 + 1.7(1.9 miles)

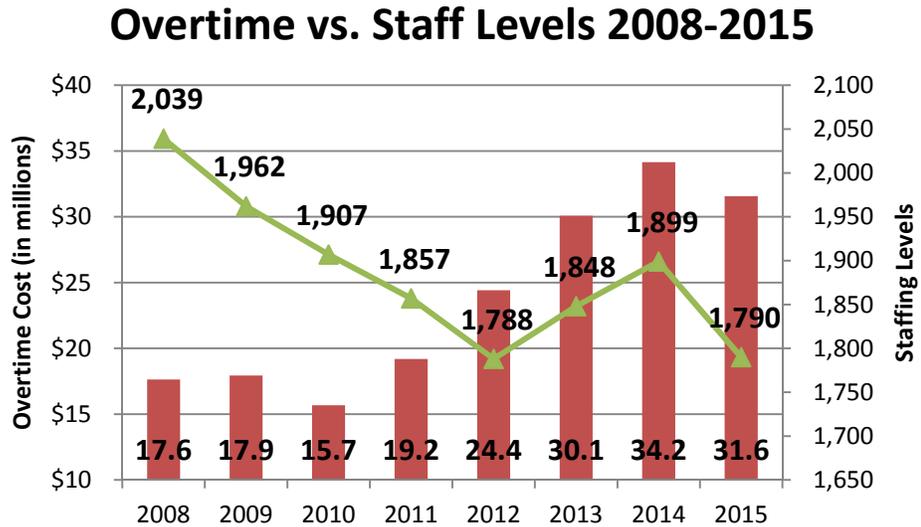
Middleton Street fire. The conclusions in that report may have provided information on why it took Ladder 8 over 18 minutes to arrive on scene. Accordingly, we could not corroborate statements management made at the entrance conference for this audit that Ladder 8 became lost enroute to the fire.

Receipt of the LODD Report may have shed light on the impact that the “Firefighter Rotation Policy” had on Ladder 8’s response time to the specific fire at 1655 Middleton Street. Nevertheless, a review of Ladder 8’s roster showed that firefighters on duty that morning may have been unfamiliar with the community and their first alarm district. For instance, we observed that two of the firefighters had been transferred to the fire station just 10 months earlier in February 2014. A third firefighter had been assigned in February 2013 — less than two years earlier — and the captain on duty had been assigned to the station only since December 2011.

Despite Claims of Savings, Overtime Costs Grew Significantly

Upon announcing the implementation of brownouts, the PFD asserted the city would save about \$3.8 million dollars in overtime costs. However, since inception of the brownouts, city records show that overtime for the PFD firefighters more than doubled at its peak in fiscal year 2014. As depicted in Figure 5 below, since the brownouts began in 2010, overtime costs climbed from \$15.7 million in fiscal year 2010 to \$34.2 million in fiscal year 2014.

Figure 5: Firefighter Overtime and Staffing Levels for Fiscal Years 2008 through 2015



Source: Prepared by the Office of the Controller based on the City of Philadelphia Payroll Registers.

Conclusions

The PFD’s brownout and rotation policies jeopardized public safety by negatively impacting the department’s ability to provide efficient and effective fire protection and emergency rescue to the citizens and visitors

of Philadelphia. Travel to fire emergencies can take greater times because of longer distances traveled by fire engines covering for others in browned-out fire stations. Further impacting response times, the PFD's rotation policy can place firefighters in communities with which they are unfamiliar, thus increasing the risk they may become lost enroute or not take the shortest path to the fire; thereby adding additional time to their arrival. And finally, while the impetus of the brownout policy was financial, the costs savings projected never materialized.

## Recommendations

The Controller's Office makes the following recommendations that address the effects of PFD's decisions to implement a brownout and firefighter rotation policies among firefighters:

- **PDF management and members of the mayor's administration should cease the practice of "Browning-Out" stations on a rotating basis as a way to reduce overtime costs [201315.01].** The ultimate goal of management should be to make sure the first arriving engine's travel time to a fire emergency is four minutes in accordance with the national standard. In addition, eliminating brownouts would allow flexibility for training activities when an apparatus is taken out of service.
- **PFD management and members of the mayor's administration should eliminate the Firefighter Rotation Policy [201315.02].** The Firefighter Rotation Policy replaces veteran firefighters who have become experts in their local district with firefighters who are not. In our opinion, when a new firefighter graduates from the fire academy, the best scenario in which on the job training would occur would be to pair them with a veteran firefighter who has knowledge of the intricacies of the neighborhood streets and structures. This invaluable knowledge includes the best streets to take due to the size of their trucks, the traffic patterns based on the time of day, which streets have low-hanging wires, overpasses or tight corners, the location of the fire hydrants, and which houses have side and basement doors, etc.

**Other Matters  
Coming to Our  
Attention**

As part of our audit work, we observed three additional matters that we believe require the PFD management’s attention. In our opinion, these matters directly impact the ability of firefighters to reach the scene of fire emergencies within the NFPA’s criteria. More specifically, we observed that after being notified about the emergency, the time it takes firefighters to suit up, get to the vehicle, board the vehicle, and safely secure themselves for travel (*Turnout Time*) is longer than recommended by the NFPA. Additionally, in many areas of the city, the PFD appears to have not kept pace with the changing development over the years, and this in turn had perhaps contributed to the department’s inability to meet the NFPA national standard even before implementation of the brownout and rotation policies. Finally, during our review of data in the department’s CAD, we observed instances of when recorded times were incomplete and sometimes inaccurate. Many of these instances involved emergencies where a death or injury occurred. Each of the matters is discussed below.

**Poor Turnout  
Time Adding to  
PFD’s Response  
Problem**

According to the NFPA, an engine should turnout in 80 seconds, no less than 90 percent of the time. Our analysis of engine response times depicted in Table 3 below, shows that none of PFD’s 56 engines were able to meet the 80 second benchmark. In many instances, (those shaded) certain engines were consistently 50 percent or below achieving the 80-second goal during the eight-year period.

**Table 3: Total Turnout Time by Engine and Year**

| <b>Engine Company</b> | <b>2008</b> | <b>2009</b> | <b>2010</b> | <b>2011</b> | <b>2012</b> | <b>2013</b> | <b>2014</b> | <b>2015</b> |
|-----------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Engine 2              | 50%         | 43%         | 42%         | 44%         | 48%         | 55%         | 65%         | 77%         |
| Engine 3              | 35%         | 38%         | 26%         | 52%         | 69%         | 71%         | 72%         | 84%         |
| Engine 5              | 44%         | 42%         | 40%         | 34%         | 43%         | 50%         | 67%         | 61%         |
| Engine 7              | 31%         | 44%         | 33%         | 37%         | 50%         | 47%         | 54%         | 63%         |
| Engine 9              | 33%         | 36%         | 29%         | 31%         | 34%         | 37%         | 49%         | 54%         |
| Engine 10             | 38%         | 37%         | 44%         | 43%         | 35%         | 45%         | 59%         | 63%         |
| Engine 11             | 30%         | 33%         | 41%         | 45%         | 41%         | 43%         | 48%         | 44%         |
| Engine 12             | 25%         | 28%         | 29%         | 32%         | 39%         | 40%         | 48%         | 39%         |
| Engine 13             | 45%         | 42%         | 41%         | 39%         | 43%         | 39%         | 56%         | 57%         |
| Engine 16             | 49%         | 46%         | 43%         | 40%         | 39%         | 53%         | 68%         | 67%         |
| Engine 18             | 36%         | 31%         | 29%         | 25%         | 23%         | 34%         | 51%         | 50%         |
| Engine 19             | 22%         | 21%         | 27%         | 27%         | 42%         | 48%         | 58%         | 47%         |
| Engine 20             | 35%         | 32%         | 36%         | 43%         | 63%         | 55%         | 62%         | 62%         |
| Engine 22             | 21%         | 15%         | 18%         | 21%         | 22%         | 39%         | 49%         | 54%         |
| Engine 24             | *           | 42%         | 43%         | 52%         | 63%         | 69%         | 65%         | 72%         |
| Engine 25             | 46%         | 46%         | 49%         | 51%         | 64%         | 68%         | 76%         | 78%         |
| Engine 27             | 32%         | 31%         | 30%         | 28%         | 53%         | 54%         | 54%         | 60%         |
| Engine 28             | 51%         | 43%         | 38%         | 52%         | 56%         | 65%         | 68%         | 70%         |
| Engine 29             | 43%         | 38%         | 37%         | 38%         | 40%         | 46%         | 65%         | 72%         |
| Engine 33             | 25%         | 28%         | 20%         | 33%         | 37%         | 47%         | 63%         | 57%         |
| Engine 34             | 38%         | 44%         | 39%         | 34%         | 52%         | 48%         | 60%         | 63%         |
| Engine 35             | 30%         | 25%         | 27%         | 24%         | 22%         | 23%         | 31%         | 46%         |

| <b>Engine Company</b> | <b>2008</b> | <b>2009</b> | <b>2010</b> | <b>2011</b> | <b>2012</b> | <b>2013</b> | <b>2014</b> | <b>2015</b> |
|-----------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Engine 36             | 29%         | 25%         | 24%         | 25%         | 29%         | 42%         | 59%         | 62%         |
| Engine 37             | 22%         | 28%         | 28%         | 32%         | 32%         | 27%         | 40%         | 43%         |
| Engine 38             | 38%         | 33%         | 43%         | *           | 37%         | 53%         | 55%         | 53%         |
| Engine 40             | 48%         | 44%         | 42%         | 49%         | 57%         | 65%         | 81%         | 80%         |
| Engine 41             | 49%         | 51%         | 46%         | 40%         | 56%         | 65%         | 77%         | 70%         |
| Engine 43             | 26%         | 24%         | 26%         | 28%         | 35%         | 41%         | 45%         | 51%         |
| Engine 44             | 38%         | 33%         | 37%         | 25%         | 35%         | 33%         | 37%         | 42%         |
| Engine 45             | 41%         | 45%         | 46%         | 43%         | 59%         | 52%         | 59%         | 71%         |
| Engine 46             | 22%         | 29%         | 32%         | 37%         | 24%         | 32%         | 53%         | 50%         |
| Engine 47             | 31%         | 37%         | 32%         | 32%         | 43%         | 44%         | 44%         | 50%         |
| Engine 49             | 40%         | 37%         | 41%         | 33%         | 39%         | 35%         | 51%         | 52%         |
| Engine 50             | 28%         | 30%         | 27%         | 32%         | 39%         | 33%         | 39%         | 47%         |
| Engine 51             | 27%         | 30%         | 26%         | 30%         | 50%         | 47%         | 46%         | 59%         |
| Engine 52             | 38%         | 39%         | 40%         | 38%         | 44%         | 48%         | 54%         | 65%         |
| Engine 53             | 26%         | 34%         | 38%         | 38%         | 39%         | 43%         | 57%         | 60%         |
| Engine 54             | 45%         | 43%         | 42%         | 37%         | 36%         | 45%         | 48%         | 55%         |
| Engine 55             | 38%         | 39%         | 42%         | 48%         | 38%         | 50%         | 71%         | 74%         |
| Engine 56             | 19%         | 14%         | 23%         | 36%         | 49%         | 56%         | 60%         | 44%         |
| Engine 57             | 47%         | 44%         | 42%         | 38%         | 35%         | 42%         | 57%         | 76%         |
| Engine 58             | 20%         | 23%         | 22%         | 20%         | 35%         | 38%         | 47%         | 55%         |
| Engine 59             | 47%         | 44%         | 46%         | 46%         | 64%         | 74%         | 75%         | 84%         |
| Engine 60             | 31%         | 31%         | 30%         | 38%         | 53%         | 58%         | 61%         | 59%         |
| Engine 61             | 37%         | 37%         | 43%         | 51%         | 54%         | 46%         | 55%         | 53%         |
| Engine 62             | 25%         | 30%         | 30%         | 34%         | 37%         | 43%         | 52%         | 65%         |
| Engine 63             | 33%         | 30%         | 31%         | 29%         | 50%         | 55%         | 53%         | 54%         |
| Engine 64             | 39%         | 49%         | 45%         | 43%         | 39%         | 42%         | 42%         | 62%         |
| Engine 66             | 43%         | 36%         | 32%         | 21%         | 31%         | 46%         | 52%         | 50%         |
| Engine 68             | 26%         | 34%         | 32%         | 34%         | 58%         | 74%         | 69%         | 55%         |
| Engine 69             | 19%         | 22%         | 21%         | 19%         | 22%         | 32%         | 35%         | 46%         |
| Engine 70             | 32%         | 36%         | 41%         | 38%         | 39%         | 50%         | 55%         | 66%         |
| Engine 71             | 25%         | 31%         | 26%         | 28%         | 31%         | 39%         | 45%         | 59%         |
| Engine 72             | 35%         | 35%         | 36%         | 31%         | 39%         | 46%         | 62%         | 56%         |
| Engine 73             | 36%         | 39%         | 31%         | 32%         | 41%         | 42%         | 61%         | 68%         |
| Engine 78             | 60%         | 57%         | 69%         | 64%         | 65%         | 56%         | 62%         | 69%         |

\* Engine was temporarily closed.

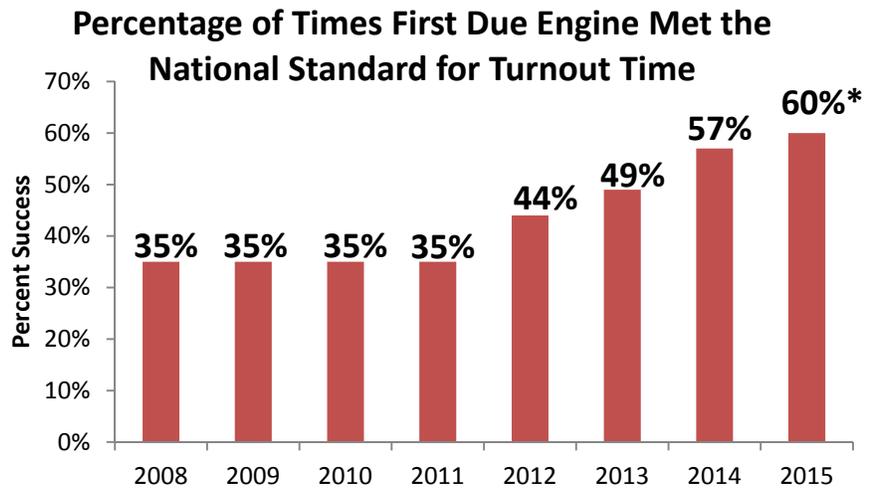
Source: Prepared by the Office of the Controller based on the PFD's CAD file.

Although for the years under review the PFD had not achieved the national benchmark for turnout time, it has made considerable improvement. In 2008, the PFD met the 80-second benchmark only 35 percent of the time; however, through the first six months of 2015, its achievement rate climbed to 60 percent (see Figure 6).

Because our audit was to ascertain the impact of the PFD's rolling "brownout" and "rotation" policies on response times to fire emergencies, we did not focus on turnout time. However, we believe that turnout time may also be impacted by brownouts and/or firefighter rotation. The firefighters level of knowledge with the gap area around the browned-out

company can result in a longer turnout time because firefighters need to determine a travel route to the affected location in the gap. In addition, recently rotated firefighters may not be familiar with their local district. Before responding, they need to determine and confirm the shortest travel route to the incident. As such, we did not establish reasons the PFD’s turnout time over the almost eight-year period was so poor. However, in addition to these two policies, we believe that more likely than not the causes for the PFD’s slow turnout might possibly be attributed to (1) poor procedures, (2) untrained staff, (3) firefighter dissatisfaction; or a combination of any of these factors. The effects of any single factor or a combination of these impediments to timely response could ultimately increase the risks for more injuries and possible deaths to firefighters and civilians.

Figure 6: Turnout Time For First Responding Engine Improving



\* 2015 data represents the first six months of the calendar year.  
 Source: Prepared by the Office of the Controller based on the PFD CAD Data

Recommendation

We recommend that PFD management investigate what may be causing poor turnout time for its engines. After identifying the problem, or problems, it should develop corrective action [201315.03].

Fire Station Locations Have Not Always Kept Pace with City’s Development

The area of coverage for fire stations may be contributing to the inability of firefighters to reach the emergency scene timely. A visual view of the district map in Appendix III shows that many engines cover a vastly wider area than others. For instance, Engine 22 located at 3270 Comly Road in the far Northeast section of the city and meeting the travel time goal of 4 minutes fifty-five percent of the time in 2014, covers a territory of approximately eight square miles. Contrast this success rate with Engine 27, which met the goal eighty-one percent of the time in 2014. This fire station is located at 1901-15 Oxford Street in lower North Philadelphia, and covers less than one square mile.

Again, as addressed on the previous page, the scope of this audit was to determine if the brownout and rotation policies were having impact on the PFD's response to fire emergencies. In doing so, we observed that even before implementation of these policies the PFD was not achieving the national standard for arriving timely to fires. Therefore, we believe there may be too few fire stations to cover certain areas of the city, which over time have developed or redeveloped and become more populated.

For example, on the grounds of the former Philadelphia State Hospital at Byberry, closed in 1990, now stands The Arbours at Eagle Pointe. This 55+ active adult community has approximately 290 structures, covered by Engines 22 and 58, which are both more than two miles away from a majority of the dwellings.

As we stressed throughout this report, slower response to fire emergencies can mean the difference between life and death. In our opinion, PFD management and the mayor's administration need to let public safety be the main driving force behind its decision making.

Recommendation

We recommend that PFD management and members of the mayor's administration investigate other causes impeding quicker response to fire emergencies. In particular, we suggest they examine the coverage area of fire stations. If coverage is a driving cause, then the administration needs to develop a viable financial solution to building fire stations where appropriate [201315.04].

Operational Data  
Sometimes  
Incomplete and  
Inaccurate

For management controls to be effective, it is essential that the underlying data that managers use to compute performance measures is complete, accurate, and reliable. Throughout this review, the Controller's Office observed instances when data contained in the PFD's CAD System was incomplete and inaccurate. Many of these incidents involve fire emergencies where there occurred a death or injury (see section titled *Slower Travel Time May Have Contributed to Incidents Involving Death and Injuries*).

About 5,500, or roughly 11 percent of the calendar year 2014 fire incidents, lacked a component of time necessary for computing response time. The most frequent missing time component was "on-scene" time, but the "enroute" time was also sometimes missing. According to PFD Directive #42 - Fire Department Communications, Section 4.6.7a - Tactical Box and Box Assignments, "The first arriving unit will verbally acknowledge their arrival at the assignment immediately, giving specific location and conditions as observed and orders for incoming companies. The first arriving unit will also use the "OnScn" button to document their arrival on the incident scene. All other units will use their "OnScn" buttons to document their arrival at the incident scene." So as stated, all other units

will use their MDT<sup>16</sup> to send an “enroute” and “on-scene” message to the CAD system. When the Controller’s Office requested PFD management to explain why there was no response time listed for certain incidents in the CAD, they responded that the missing on-scene time could be the result of an upgraded incident in which a civilian was trapped thus getting into service became immediate priority for the first arriving engines as well as FCC dispatchers. It is understood that life safety is always a priority. Additionally, it is understandable that when the first-due engine arrives on location and has many tasks to perform, there is always a possibility that the officer of this unit cannot acknowledge arrival on radio because of radio messages. But as stated in the PFD Directive #42, all units including the first-arriving unit, will use their “on-scene” buttons (on MDT unit) to document in the CAD their arrival time at the incident scene.<sup>17</sup> Documenting the “on-scene” time of fire units through the MDT is critical information. However, the practice of not reporting “on-scene” times via MDT, for multiple units, is critical missing information for specific incidents.

Recommendation

We recommend that PFD management investigate the cause of missing or inaccurate components of time in the CAD and develop corrective action that may include holding either the engine and ladder companies or the FCC responsible for not recording the appropriate time components in the CAD per PFD Directive #42 [201315.05].

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<sup>16</sup> An MDT is a Mobile Data Terminal which is a laptop installed in PDF vehicles. They are a component of the CAD and are connected by EVDO air cards. They receive dispatch notifications and allow officers to update their unit status without using the radio.

<sup>17</sup> In December 2012, PFD Directive #42 was updated to include all units responding to a fire incident to use the on-scene button on the MDT unit as well as continuing to require the first responding unit to verbally acknowledge their arrival time. Prior to 2012, only the first responding engine was required to verbally acknowledge their arrival time.

This appendix provides information on the scope of work and methodology we used to ascertain the impact of the PFD's rolling "brownout" and "rotation" policies on response times to fire emergencies in Philadelphia. We performed our work with the assistance of Robert C. Drennen, M.S., M.Ed., CFPS, CFI, CFO. Mr. Drennen is a consultant and former PFD battalion chief.

In analyzing the impact of the PFD's rolling brownout and rotation policies, we considered the timeline of events between the initial dispatch and the first engines arrival on scene. We did not examine the timeline between the call to the 9-1-1 call center and dispatch.

To accomplish our objective we performed the following work:

- Requested and obtained the PFD's computer assisted dispatch (CAD) system files for calendar years 2008 through 2014, and January 1 through June 30, 2015. Using computer assisted audit software, for each year, we determined the frequency with which the PFD's first-due engines arrived on scene after the initial dispatch. In arriving at these frequencies, we first identified the number of incidents classified as fire emergencies (vs. medical emergencies). We then used this population of incidents to compute response times. Because with any given fire emergency call there may be more than one engine to begin a response, in computing response times, we used the response time of the first engine to arrive on scene at the fire location.<sup>18</sup> We believe this approach yielded the fairest assessment of the department's best effort to respond to a call for assistance with the most appropriate engine.

In computing the frequency of response times, the scope of our work was restricted because thousands of CAD records contained errors. Some records contained errors in the enroute times, while others failed to show an on-scene entry for the incident. Additionally, in computing response times, we eliminated from the analyses those fire incidents in which none of the first five apparatuses were an engine, primarily due to the fact that the CAD file did not reflect the on-scene times for dispatched engines. Table 4 below shows a summary of the number of incidents used to compute response times in our work.

- Compared actual frequency of response times to benchmark times set forth in National Fire Protection Association 1710: Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations and Special Operations to the Public by Career Fire Departments, (NFPA 1710), which has been adopted by the

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<sup>18</sup> For all fire responses the minimum response required is a tactical box, which requires two engines to respond.

- PFD. In making our comparisons, we focused on two elements of the benchmark: (1) **turnout time** (the time interval that begins with notification of the emergency response units by either an audible alarm or visual annunciation or both and *ends at the beginning point of travel time*) of 80 seconds or less for fire responses at least 90 percent of the time; and (2) **travel time** (*the time interval that begins when a unit is en route to the emergency incident and ends when the unit arrives at the scene*) of 240 seconds or less for the arrival of the first due engine company at least 90 percent of the time.

**Table 4: Number of Incidents Used to Compute Response Time**

|  | <u>2015*</u>   | <u>2014</u>    | <u>2013</u>    | <u>2012</u>    | <u>2011</u>    | <u>2010</u>    | <u>2009</u>    | <u>2008</u>    |
|--|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| <u>Total CAD incidents</u>   | 159,429        | 320,075        | 307,533        | 304,336        | 305,236        | 297,674        | 294,938        | 292,389        |
| Less: CAD incidents classified as medical response or other non-fire incidents | <u>133,591</u> | <u>270,621</u> | <u>262,866</u> | <u>259,085</u> | <u>257,520</u> | <u>250,227</u> | <u>247,457</u> | <u>243,491</u> |
| Unique incidents identified as fire  | 25,838         | 49,454         | 44,667         | 45,251         | 47,716         | 47,447         | 47,482         | 48,804         |
| Non-emergency Incidents  | -4,240         | -8,089         | -6,570         | -6,610         | -8,104         | -8,286         | -8,366         | -8,082         |
| Incidents with call-time errors  | -2,842         | -5,500         | -4,862         | -5,258         | -6,085         | -6,296         | -6,748         | -8,113         |
| Unique incidents involving an engine   | <u>18,756</u>  | <u>35,865</u>  | <u>33,235</u>  | <u>33,383</u>  | <u>33,525</u>  | <u>32,865</u>  | <u>32,367</u>  | <u>32,703</u>  |
| Incidents classified as outliers   | -756           | -1,535         | -1,179         | -1,273         | -1,430         | -1,477         | -1,076         | -997           |
| Unique incidents used for computing response time                              | <u>18,000</u>  | <u>34,330</u>  | <u>32,056</u>  | <u>32,110</u>  | <u>32,095</u>  | <u>31,388</u>  | <u>31,291</u>  | <u>31,706</u>  |

\* 2015 data represents the first six months of the calendar year.  
 Source: Prepared by the Office of the Controller based on the PFD’s CAD file.

- Performed a two-sample “t-test”<sup>19</sup> to determine whether the differences between the pre and post brownout response times for each engine represented real differences between the response times or if the differences were just due to chance. If the result of the “t-test” was below a five percent probability, we determined that there was a statistically significant difference. The tests concluded that 51 of 56 engines had a significant difference in travel time after the brownouts became effective on August 2, 2010. In other words, we can conclude that the difference in response times before and after brownouts was not caused by chance.

<sup>19</sup> A t-test is a statistical test that checks if two means (averages) are reliably different from each other. It is a statistic that can be used to make inferences about the population beyond our data.

- We also analyzed certain other incidents, highlighted by the media, to determine whether brownouts played a significant part in the response times for those incidents.
- Reviewed firefighter rotation general memorandums from calendar years 2013 to 2015, to determine the number of engines in which a platoon had three or more new or recently transferred firefighters.<sup>20</sup> We then examined the response times for those engines to determine whether they were significantly less than engines with more experienced firefighters.

We performed our work from April 2015 through January 2016 in accordance with generally accepted government auditing standards issued by the Comptroller General of the United States. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

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<sup>20</sup> The PFD was unable to provide us with fiscal year 2014 rosters.

**Apparatus** — a term usually used by firefighters describing a department vehicle (i.e. fire engine).

**Full Box** — an initial dispatch response consisting of four (4) Engine Companies, two (2) Ladder Companies and two (2) Battalion Chiefs.

**Computer Aided Dispatch System (CAD)** — a proprietary dispatch computer system operating on the Northrop Grumman Integrity Cad Platform. It utilizes a Geo File based on the city's street centerline files for address verification and has been customized by FCC personnel to provide dispatch recommendations based on existing Philadelphia Fire Department operational procedures and directives.

**Engine** — a fire suppression vehicle that carries and pumps water.

**Engine Company**—a group of firefighters assigned to an apparatus with a water pump and equipped with a fire hose and other tools related to fire extinguishment.

**Fire Communications Center**—responsible for the processing of Fire and EMS calls placed through the 9-1-1 system and for the dispatch and coordination of communications with responding units.

**Fire Suppression**—activities involved in controlling and extinguishing fires.

**High-hazard Occupancy**—an occupancy that presents a high life hazard or large fire potential due to its construction, configuration, or the presence of specific materials, processes, or contents (i.e. schools, hospitals, nursing homes, explosives plants, refineries, high-rise buildings, and other high life hazard or large fire potential occupancies.)

**Ladder Company**—a group of fire fighters, officers, and engineers that staff a truck that's primary duty is to supply ladders to a fire scene. The Ladder Company is also responsible for search, rescue and ventilation of the fire structure.

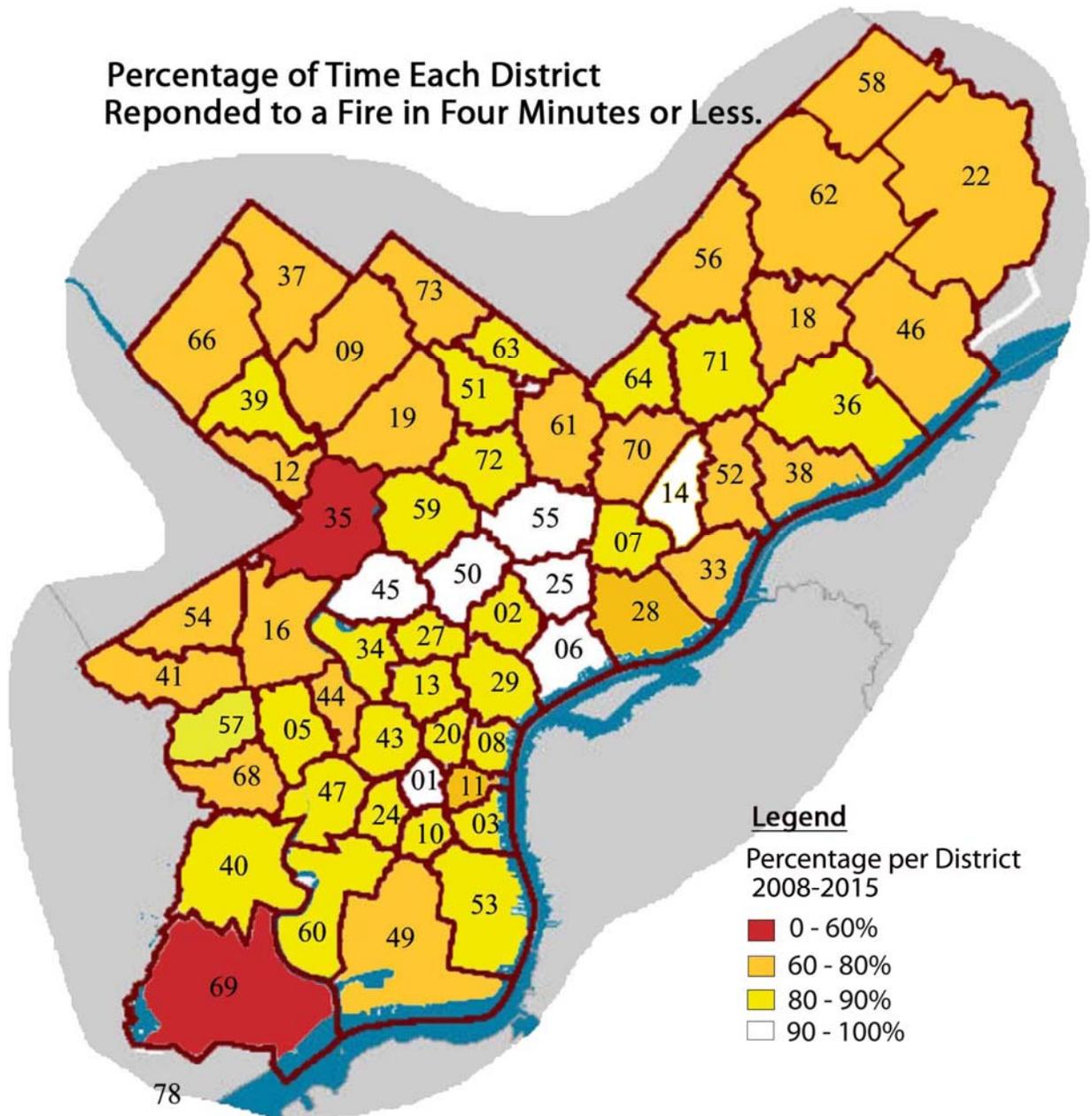
**Platoon**—a subdivision of an engine or ladder company, consisting of three or four firefighters, led by an officer.

**Tactical Box**—an initial response comprised of two (2) Engine Companies, two (2) Ladder Companies and one (1) Battalion Chief.

**Travel Time**—time interval that begins when a unit is enroute to the emergency incident and ends when the unit arrives at the scene.

**Turnout Time**—time interval that begins when the fire unit receives notification of the emergency, to the time it takes firefighters to suit up, get to the vehicle, board the vehicle, and safely secure themselves for travel.

Percentage of Time Each District  
Reponded to a Fire in Four Minutes or Less.





CITY OF PHILADELPHIA  
FIRE DEPARTMENT

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DERRICK J.V. SAWYER, EFO  
FIRE COMMISSIONER

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February 5, 2016

Mr. Alan Butkovitz, City Controller  
City Controller's Office  
1230 Municipal Services Building  
1401 John F. Kennedy Boulevard  
Philadelphia, PA 19102

RE: PHILADELPHIA FIRE DEPARTMENT (PFD) RESPONSE TO -

*The City Controller's Special Audit of the Rolling Brownout and FF Rotation Procedures and their Impact on PFD Emergency Response Time*

Dear Mr. Butkovitz:

I submit this letter and fact-based response by first acknowledging the time and effort committed by you and your staff to complete this special audit of the PFD's *Rolling Brownout and FF Rotation Procedures and their Impact on PFD Emergency Response Time*.

I am pleased to report that the Rolling Brownouts and Firefighter Rotations have ended.

Please find my attached responses to specific areas of the audit. I am available to discuss any matters related to this response in further detail.

Sincerely,

  
Derrick J. V. Sawyer  
Fire Commissioner

PHILADELPHIA FIRE DEPARTMENT RESPONSE TO CONTROLLER'S SPECIAL AUDIT



**PHILADELPHIA FIRE DEPARTMENT RESPONSE**

to

*The City Controller's Special Audit of the Rolling Brownout and Rotation  
Procedures and Their Impact on PFD Emergency Response Time*

February 2016

*Derrick J. V. Sawyer  
Fire Commissioner*

PHILADELPHIA FIRE DEPARTMENT RESPONSE TO CONTROLLER'S SPECIAL AUDIT

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PHILADELPHIA FIRE DEPARTMENT RESPONSE TO CONTROLLER'S SPECIAL AUDIT

OVERVIEW OF THE FIRE DEPARTMENT'S RESPONSE

- Brownouts have ended
- Rotations have been suspended
- Total response times to fire incidents that present potential for loss of life and/or property have consistently met or exceeded NFPA 1710
- Turnout times show significant improvement

FACTUAL CORRECTIONS

Overview and Demographics

PFD RESPONSE:

The number of PFD uniformed personnel at the end of fiscal 2015 totaled 2,112. The audit reports 2,234.

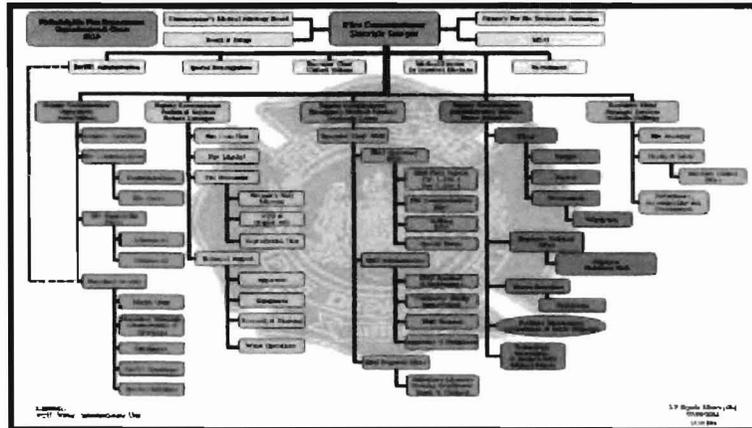
Administration

PFD RESPONSE:

In 2014, command of the Fire Communications Center transferred to the Deputy Commissioner of Operations. The audit reports this unit under the command of the Deputy Commissioner of Technical Services.

Additionally, in 2014, command of the Safety Office transferred to the Executive Chief of Strategic Services. The audit reports this unit under the command of the Deputy Commissioner of Operations. (See PFD Figure 1.)

PFD Figure 1.



PHILADELPHIA FIRE DEPARTMENT RESPONSE TO CONTROLLER'S SPECIAL AUDIT

**PFD Implemented a Brownout Policy**

**PFD RESPONSE:**

PHILADELPHIA FIRE DEPARTMENT GENERAL MEMORANDUM #15-160, which was issued on December 31, 2015, in effect, ceased the practice of "Browning-Out" stations on a rotating basis. (See Appendix A)

**PFD Established a Rotation Policy**

**PFD RESPONSE:**

The rotation policy is under review. There will be no Firefighter Rotations in 2016.

**Brownout and Rotation Policies Have Negatively Impacted Fire Response**

**PFD RESPONSE:**

As disclosed in Tables 1, 2 and 3, the Department's response performance to fire suppression incidents that present potential for loss of life and/or property consistently meets or exceeds NFPA 1710 (See Figure 2).

**Historical Trend Shows PFD Has Fallen Short of the National Standard for Fire Response**

**PFD RESPONSE:**

NFPA 1710 objectives for travel time apply to "all activities performed at the scene of a fire incident or training exercise that expose fire department members to the dangers of heat, flame, smoke, and other products of combustion, explosion, or structural damage."

PFD meets or exceeds the total response time objectives of NFPA 1710 for incidents where firefighters may encounter trapped victims<sup>1</sup>, rapid-fire spread situations, and similar threats to life and property. Response times at emergency speed<sup>2</sup> to fire suppression incidents with the potential for loss of life and/or property have met or exceeded the national standard for fire response, during the 6-year NFIRS reporting period beginning in 2010 through 2015 (See Table 1).

PFD recognizes that it does not meet NFPA 1710 objectives as they relate to fires involving rubbish, brush, dumpsters, grass, leaves, mail, signs, trees, vehicles, and trucks. However, turnout times for these incidents have significantly improved since 2010 and PFD is committed to continued improvement in this area.

<sup>1</sup> In the City of Philadelphia 97-percent of fire fatalities occur in structure fires (Eighty-three-percent nationwide).

<sup>2</sup> Emergency Speed: In accordance with PFD Directive #42 §2.6.1., "Response speed with all warning devices in operation and in compliance with all the regulations dictated in Directive #26."

PHILADELPHIA FIRE DEPARTMENT RESPONSE TO CONTROLLER'S SPECIAL AUDIT

Tables 1, 2, and 3 exhibit the response times for structural/fire suppression operations (multi-unit), and other fire suppression responses (single engine). Table 3 specifically shows PFD single engine responses to fires involving vehicles, rubbish, brush, dumpsters, grass, leaves, mail, signs, trees, and trucks. Structure fires are not included in Table 3..

PFD Figure 2.

**NFPA® 1710**  
**Standard for the**  
**Organization and Deployment of Fire Suppression Operations,**  
**Emergency Medical Operations, and Special Operations**  
**to the Public by Career Fire Departments**  
**2010 Edition**

**4.1.2.1** The fire department shall establish the following objectives:

- (1) Alarm handling time to be completed in accordance with 4.1.2.3.
- (2) 80 seconds for turnout time for fire and special operations response
- (3)\*240 seconds or less travel time for the arrival of the first arriving engine company at a fire suppression incident and 480 seconds or less travel time for the deployment of an initial full alarm assignment at a fire suppression incident

**\*Annex: A.3.3.23 Fire Suppression.** Fire suppression includes all activities performed at the scene of a fire incident or training exercise that expose fire department members to the dangers of heat, flame, smoke, and other products of combustion, explosion, or structural collapse.

PHILADELPHIA FIRE DEPARTMENT RESPONSE TO CONTROLLER'S SPECIAL AUDIT

PFD Table 1.

| <b>Analysis for First Arriving Engine Unit on Tactical Box<sup>3</sup> and Box Alarm<sup>4</sup> NFPA 1710 Assignments (Fire Suppression; multi-unit responses)</b> |                      |                            |                           |                                   |
|---|----------------------|----------------------------|---------------------------|-----------------------------------|
| <b>Year</b>   | <b>Runs Analyzed</b> | <b>Turnout Time (1:20)</b> | <b>Travel Time (4:00)</b> | <b>Total Response Time (5:20)</b> |
| 2010  | 6,345                | 58%                        | 93%                       | 93%                               |
| 2011  | 6,096                | 58%                        | 93%                       | 92%                               |
| 2012  | 5,802                | 59%                        | 93%                       | 92%                               |
| 2013  | 5,634                | 66%                        | 95%                       | 95%                               |
| 2014  | 5,960                | 72%                        | 95%                       | 95%                               |
| 2015  | 5,957                | 77%                        | 95%                       | 96%                               |

PFD Table 1a.

| <b>Initial Dispatch Types for First Arriving Engine Unit on Tactical Box and Box Alarm NFPA 1710 Assignments (Fire Suppression; multi-unit responses)</b> |               |           |
|---|---------------|-----------|
| APPLIANCE   | HAZMAT        | SCHOOL    |
| APARTMENT   | HEATER        | STORE     |
| BUILDINGS   | TANKER        | STOVE     |
| BOX   | HIRISE        | STRUCTURE |
| CHIMNEY   | AIRPORT (PNL) | SUBWAY    |
| DWELLING  | AIRPORT (PHL) | TRAIN     |
| EXPLOSION   | PIER          |           |
| GARAGE  | REFINERY      |           |

PFD Tables 1 and 1a, shows PFD response performance to fire suppression incidents with the potential for loss of life and/or property . As is evident in Table 1, turnout times have improved by 19-percentage points since 2010, the year the brown outs began. Travel time and total response times remained consistent over the six-year period, both clearly exceeding the 90% objective.

<sup>3</sup> TACTICAL BOX: An initial response comprised of two (2) Engine Companies, two (2) Ladder Companies, and one (1) Battalion Chief

<sup>4</sup> BOX ALARM: An initial dispatch response consisting of four (4) Engine Companies, two (2) Ladder Companies, and two (2) Battalion Chiefs

PHILADELPHIA FIRE DEPARTMENT RESPONSE TO CONTROLLER'S SPECIAL AUDIT

PFD Table 2.

| <b>Analysis for First Arriving Engine Unit on Fire Suppression, non-EMS, Emergency Speed NFPA 1710 Responses (multi-unit and single engine responses)</b> |                      |                            |                           |                                   |
|---|----------------------|----------------------------|---------------------------|-----------------------------------|
| <b>Year</b>   | <b>Runs Analyzed</b> | <b>Turnout Time (1:20)</b> | <b>Travel Time (4:00)</b> | <b>Total Response Time (5:20)</b> |
| 2010  | 13,856               | 43%                        | 84%                       | 81%                               |
| 2011  | 13,112               | 42%                        | 83%                       | 80%                               |
| 2012  | 12,729               | 47%                        | 83%                       | 81%                               |
| 2013  | 11,767               | 51%                        | 85%                       | 83%                               |
| 2014  | 12,407               | 59%                        | 84%                       | 83%                               |
| 2015  | 12,835               | 64%                        | 84%                       | 84%                               |

PFD Table 2a.

| <b>Initial Dispatch Types for First Arriving Engine Unit on Fire Suppression, non-EMS, Emergency Speed NFPA 1710 Responses (multi-unit and single engine responses)</b> |                       |                       |
|---|-----------------------|-----------------------|
| APPLIANCE   | LEAVES                | TREE                  |
| APARTMENT   | MAIL                  | TRUCK                 |
| AUTO  | AIRPORT (PNL)         | GRASS                 |
| BUILDING  | AIRPORT (PHL)         | HAZMAT                |
| BOX   | PIER                  | HEATER                |
| BRUSH   | REFINERY              | HIRISE                |
| CHIMNEY   | RUBBISH               | STOVE                 |
| DUMPSTER  | SCHOOL                | STRUCTURE             |
| DWELLING  | SIGN                  | SUBWAY                |
| EXPLOSION   | STORE                 | TANKER                |
| GARAGE  | TRAIN                 | EXPRESSWAY RESPONSE   |
| INCINERATOR   | INSIDE WIRES/DWELLING | INSIDE WIRES/BUILDING |

PFD Tables 2 and 2a present PFD responses to all potential fire suppression incidents inclusive of incidents with the potential for loss of life and/or property as well as, vehicles, rubbish, brush, dumpsters, grass, leaves, mail, signs, trees, and trucks. For these types of responses, PFD personnel show a 21-percentage point improvement in turnout time. Again, travel time and response time remain consistent over the six-year period.

PHILADELPHIA FIRE DEPARTMENT RESPONSE TO CONTROLLER'S SPECIAL AUDIT

PFD Table 3.

| <b>Analysis for First Arriving Engine Unit on non-EMS, non-Structural Emergency Speed NFPA 1710 Responses (single engine responses)</b> |                      |                            |                           |                                   |
|---|----------------------|----------------------------|---------------------------|-----------------------------------|
| <b>Year</b>   | <b>Runs Analyzed</b> | <b>Turnout Time (1:20)</b> | <b>Travel Time (4:00)</b> | <b>Total Response Time (5:20)</b> |
| 2010  | 7,511                | 30%                        | 76%                       | 71%                               |
| 2011  | 7,016                | 29%                        | 75%                       | 69%                               |
| 2012  | 6,927                | 37%                        | 74%                       | 71%                               |
| 2013  | 6,133                | 38%                        | 76%                       | 72%                               |
| 2014  | 6,447                | 47%                        | 74%                       | 72%                               |
| 2015  | 6,878                | 53%                        | 75%                       | 74%                               |

PFD Table 3a.

| <b>Initial Dispatch Types for First Arriving Engine Unit on non-EMS, non-Structural Emergency Speed NFPA 1710 Responses (single engine responses)</b> |                       |
|---|-----------------------|
| AUTO  | MAIL                  |
| BRUSH   | RUBBISH               |
| DUMPSTER  | SIGN                  |
| GRASS   | TREE                  |
| LEAVES  | TRUCK                 |
| EXPRESSWAY RESPONSE   | INCINERATOR           |
| INSIDE WIRES/BUILDING   | INSIDE WIRES/DWELLING |

PFD Tables 3 and 3a present PFD responses to fire suppression incidents exclusive of incidents with the potential for loss of life and/or property. For these types of responses, PFD personnel show a 23-percentage point improvement in turnout time. As previously indicated, PFD does not generally respond to these incidents at Emergency Speed.

**Travel Time Has Been Increasing**

**PFD RESPONSE:**

NFPA 1710 sets forth the 4-minute objective for travel time to “fire suppression” incidents NFPA 1710 defines “fire suppression” as “all activities performed at the scene of a fire incident or training exercise that expose fire department members to the dangers of heat, flame, smoke, and other products of combustion, explosion, or structural collapse,” as presented in Tables 1, 2, and 3. As shown in Table 1, on Fire Department responses to incidents where there is potential for loss of life and/or structural property loss (primarily structure fires), the responding units have exceeded the NFPA 1710 performance objectives for turnout and travel time. Across all other incidents where there is the potential for responder exposure to heat, flame, smoke, and other products of combustion, travel times and total response times

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remain mostly consistent over the six-year period. Turnout times over the six-year period show continuous improvement.

PFD Tables 1, 2, & 3 show clearly that turnout times improved significantly on all 3 tables between 2013, the start of the rotations, and 2015

**Public Safety is Being Jeopardized**

**PFD RESPONSE:**

In this section, the audit cites travel distance criteria as established by item 560 of the Insurance Services Office's (ISO) Fire Suppression Rating Schedule (FSRS). The ISO offers this disclaimer about the use of Item 560:

*"In our analysis of company distribution, ISO does not measure or use actual historical response times of individual communities. Many fire departments lack accurate and reliable response-time information, and there is no standardized national recordkeeping system that would allow us to determine accurate departmental response times."<sup>5</sup>*

ISO relies on an average of 35 mph without consideration of urban traffic congestion, which is not reflective of typical Philadelphia conditions.

It is also worth noting that the Fire Communication Center does archive CAD and Firehouse data indefinitely, including historical response data of average speeds on congested city streets, as well as on limited access roadways.

**Brownouts have Compromised Coverage for High Hazard Areas**

**PFD RESPONSE:**

Table 1 presents the PFD's response time performance to incidents with the potential for loss of life and/or property

**Forced Rotation of Firefighters Could Lead to Inexperienced Responses**

**PFD RESPONSE:**

PFD Tables 1, 2, & 3 show clearly that turnout times improved significantly on all three (3) tables between the 2013 start of the rotations and 2015.

<sup>5</sup> <https://firechief.iso.com/FCWeb/mitigation/ppc/3000/ppc3015.jsp>  
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PHILADELPHIA FIRE DEPARTMENT RESPONSE TO CONTROLLER'S SPECIAL AUDIT

**Slower Travel Time  
May have  
Contributed to  
Incidents Involving  
Death and Injuries**

**PFD RESPONSE:**

PFD Tables 1, 2, & 3 show that travel times and total response times have held steady and turnout times have continually improved. The most significant of these improvements in turnout time occurred between 2013 and 2014, at the start of rotations.

**Despite Claims of  
Savings, Overtimes  
Costs Grew  
Significantly**

**PFD RESPONSE:**

Fire suppression uniformed staffing levels continued to decrease both because of the DROP program and because no firefighters were hired from FY09 to FY13. These factors left the Department extremely short-staffed and contributed to the increase in overtime costs.

In addition, during this same period, there was a significant increase in public demand for Emergency Medical Services (EMS) as is the case nationwide. To meet this demand, the Fire Department increased the number of medic units responding to calls for Emergency Medical Service from 36 medic units to 50 medic units during this same time period. This obviously required an increase in EMS staffing. However, EMS was also understaffed and could not meet the demand. The PFD addressed this personnel shortage by temporarily assigning firefighters to Medic Units and backfilling their regular fire suppression positions with overtime personnel. Consequently, the redeployment of personnel to meet the EMS demand increased overtime costs.

Lastly, another continuing overtime expenditure was the periodic cancelling of brownouts for extreme heat, snow conditions, special events, training, etc.

The Fire Department made staffing a high priority to address the overtime issue and the following was accomplished:

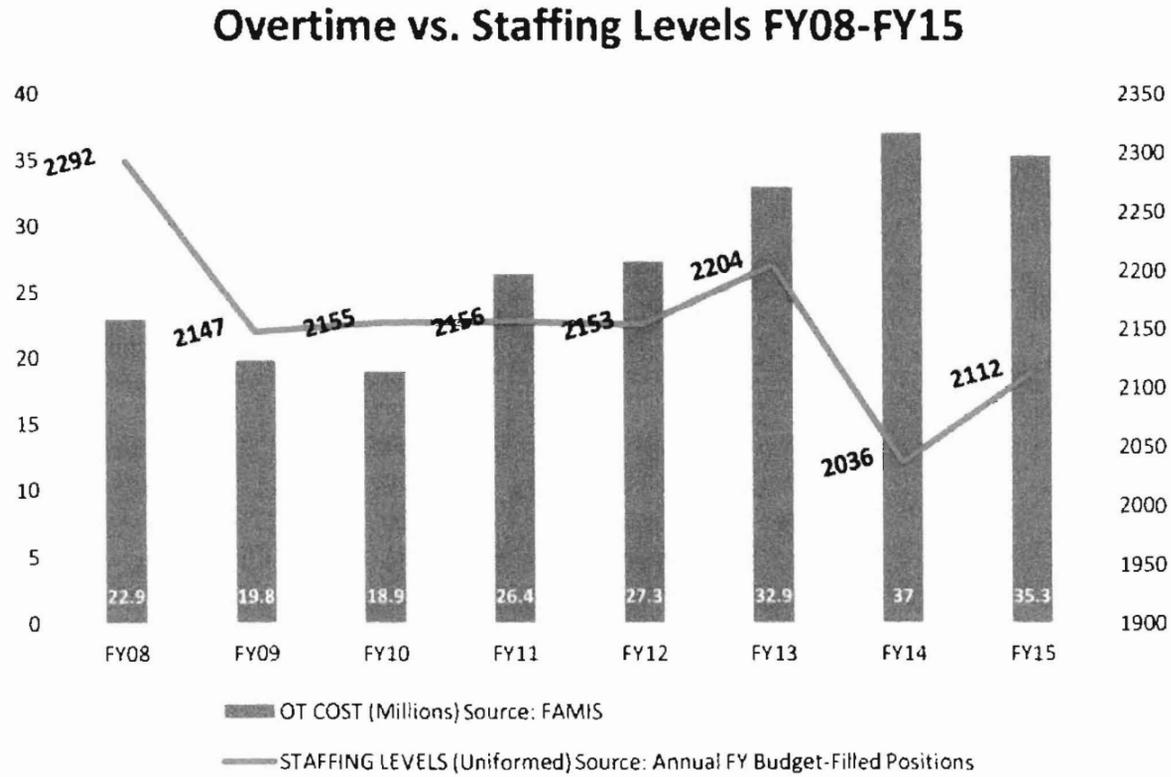
- 1) 200 EMTs were hired to staff medic units in FY15;
- 2) 40 paramedics were hired in October 2015;
- 3) 100 Firefighters were hired in July 2015, and graduated in January 2016; and,
- 4) 200 firefighters were hired in January 2016 to graduate in June 2016.

As a direct result of the accelerated hiring of new employees, the fire department's overtime costs decreased in FY15 (See Figure 2.).

PFD Figure 3, below presents overtime and staffing data.

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PFD Figure 3.



### Controller's Recommendations

**Cease the Practice of Browning-Out Stations**

**PFD RESPONSE:**

PHILADELPHIA FIRE DEPARTMENT GENERAL MEMORANDUM #15-160, which was issued on December 31, 2015, in effect, ceased the practice of "Browning-Out" stations on a rotating basis. (See Appendix A).

**Eliminate the Firefighter Rotation Policy**

**PFD RESPONSE:**

The rotation policy is under review, there will be no Firefighter Rotations in 2016.

PHILADELPHIA FIRE DEPARTMENT RESPONSE TO CONTROLLER'S SPECIAL AUDIT

**PFD Management  
[Should] Investigate  
What May be  
Causing Poor  
Turnout Times for its  
Engines**

**PFD RESPONSE:**

The current PFD administration recognized in 2014 that the turnout time component of total response time to NFPA 1710 eligible responses is the performance component most in need of improvement. The following measures were implemented to prompt the changes in employee behavior that are required to consistently meet or exceed the 90th percentile performance objective for Turnout Time:

- a) In August 2014, the PFD distributed Car 2 Bulletin 14-02: Turnout Time<sup>6</sup> (See Appendix B)
- b) In November of 2014, the PFD directed MIS/OIT to use GIS and FIREHOUSE Software<sup>®</sup> to collect, track, and report department turnout time. (See Appendix C)
- c) At each Field Staff Meeting Car 2 directed Chief Officers to continually remind Company Officers of their duty as response unit supervisors for reducing Turnout Time.
- d) Through CY2014 and CY2015 Turnout Time compliance on NFPA 1710 eligible responses, have improved 11-percentage points over 2013, from 66% to 77% (See PFD Table 1). In fact, turnout times have improved by an average of 21-percentage points since 2010 (See PFD Tables 1, 2, &3).
- e) Currently the Department has applied for 911 capital funding to design and build NFPA 1221<sup>7</sup> and 1710 compliant fire station alerting systems. These systems are designed to lower responder turnout times, reduce stress on both dispatchers and responders, and meet NFPA 1221 and 1710 Standards.

Tables 1, 2, & 3 of this response confirm that turnout times continue to improve and travel times have been consistent.

<sup>6</sup> As set-forth, in a PFD strategic planning retreat held in early 2014, Car 2's Office is the "Objective Owner" for PFD Performance Measure 2: Fire Response Time

<sup>7</sup> NFPA 1221: Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems  
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**PFD Management and Members of the Mayor's Administration Should Investigate Other Causes Impeding Quicker Response to Fire Emergencies**

**PFD RESPONSE:**

In 2015, the Fire Department acquired a suite of GIS analytical software applications developed by Deccan International. This powerful strategic planning tool enables the Department to simulate various deployment scenarios (for example, station re-location) which effectively test and evaluate the impact of changes if as well as make comprehensive deployment recommendations<sup>8</sup>. Procured at over a half million dollars, and with the continuing robust technical support from the vendor, the Fire Department intends to maximize its analytical potential by defining response areas and resource deployment. These applications will serve as an invaluable aid as the Fire Department collaborates with Public Property Capital Projects, the Finance Department, and the City Planning Commission to define the future station locations and response areas that best meet the continually emerging response demands of a growing city.

**Operational Data Sometimes Incomplete and Inaccurate**

**PFD RESPONSE:**

To address the periodic occurrence of missing CAD data, the current PFD administration has issued communications in the form of Operating Instructions and General Memoranda to personnel concerning the importance of documenting "on-scene" time via radio and the Mobile Data Terminal (MDT). (See Appendix D).

With regard to specific occurrences of missing "on-scene" CAD data, on Wednesday, October 28, 2015 the Controller's Office asked the PFD to explain why there is no on-scene time listed in CAD incidents for the corresponding engine(s):

- 120360142 – Engines 13 & 27
- 110530383 – Engines 51 & 63
- 110610093 – Engines 27, 13, & 45
- 111090776 – Engines 29 & 20
- 111570844 – Engines 13 & 50
- 102190572 – Engine 68

Prior to December of 2012, on tactical box and box assignments, only the first in engine, ladder, and chief had to report an "on scene" status to the FCC. In December of 2012, PFD Directive #42, Fire Department Communications, was revised (See Appendix E). Specifically, Section 4.2.5 states, "On all Box and Tactical Box

<sup>8</sup> This software platform was utilized during the Papal visit with great effectiveness to define alternate response routes, which were required for units to maneuver through and around the secure Center City "traffic box."

PHILADELPHIA FIRE DEPARTMENT RESPONSE TO CONTROLLER'S SPECIAL AUDIT

assignments, the first due Engine, Ladder, and Battalion Chief must verbally acknowledge their response on the Box as well as verbally announce their arrival at the scene. All other units will use their MDT to send an 'en-route' and 'on-scene' message to CAD."

The six incidents cited all occurred prior to December of 2012. As such, only the first-in engines would be required to document an "on-scene" time, thus defining or providing response time information. Of the six incidents, on Incident #111090776, Engine 29's "on-scene" time (23:31:50) is indicated, providing a response time of 3 minutes and 34 seconds.

On the five other incidents there is no "on-scene" time indicated for the first in engine, thus response time is unavailable. Several factors could account for this fact. In all five instances, the Battalion Chief was the first arriving unit on scene. The Battalion Chief gave a comprehensive radio transmission report of nature and conditions present. In some instances, there were numerous radio transmissions between the FCC and responding units. This included, relaying details on occupant status and locations. In four of the five incidents, assignments were being upgraded by the FCC prior to the arrival of companies, thus causing an increased volume of radio traffic and transmissions.

In all six of these incidents, there were reports of civilians trapped, making the first arriving engines, as well as FCC dispatchers' immediate priorities: 1) getting into service to make rescues and begin extinguishment, 2) relaying occupant and other size-up information, and 3) upgrading assignments (ordering additional resources).

**APPENDIX I:  
Objectives, Scope,  
and Methodology**

**PFD RESPONSE:**

This section describes the methods used to establish a, "timeline of events between the initial dispatch and first engines arrival." The passage then continues, "Because with any given fire emergency call there is more than one engine to begin a response, in computing response times, we used the response time of the first engine to arrive on scene at the fire location." A footnote reference then follows that offers this explanatory note, "For all fire responses the minimum response required is a tactical box, which requires two engines to respond." Many of the PFDs non-EMS responses are single engine. The auditor (as presented in Table 3 of the audit) applied the NFPA 1710 Standard to 37,556 responses in 2014, many of which are single engine responses.

## PHILADELPHIA FIRE DEPARTMENT RESPONSE TO CONTROLLER'S SPECIAL AUDIT

**FIRE DEPARTMENT CONCLUSION**

The current PFD administration does not consider the permanent deactivation of fire companies or the implementation of rotating brownouts as optimal or permanent cost-cutting solutions. We assume that the previous PFD administration did not do so either. However, the PFD was mandated to identify solutions to cope with the economic realities of the immediate years following the 2008 collapse of financial markets. Given the choice between having to permanently deactivate another three (3) units (after having just one year before deactivating seven (7) companies), or implementing brownouts, the previous PFD administration (after conducting a comprehensive risk analysis) decided that brownouts were the least painful alternative. PFD strategic planners used historical CAD data, as well as GIS based analytical mapping software, to determine which of the department resources had to be excluded from brownout consideration to maintain a satisfactory PFD standard-of-cover throughout the city. Public safety is now, and was then, the PFD's priority. The PFD is pleased to report that because the city's financial condition has stabilized, the PFD no longer is required to conduct the rolling brownout program.

Regarding firefighter rotations, the current PFD administration, in 2015, used the firefighter rotation policy primarily to stabilize staffing imbalances in various battalions across the city. These staffing imbalances were the result of a substantial number of deferred option retirements and large gaps of time between the hiring of new firefighter classes. The current PFD administration sought and obtained approval to hire three-hundred (300) firefighter cadets in FY2016. Eighty-two<sup>9</sup> of the first 100 of these new members have filled vacancies in field units. The remaining 200 Fire Cadets are currently in training. The current PFD administration is pleased to report that as a direct result of these increases in staffing, coupled with the strategic movement of personnel to stabilize personnel imbalances, there will be no rotation of firefighters in 2016.

It is important to note that the Controller's Office utilized only Computer Aided Dispatch (CAD) data from the fire department. CAD data is primarily dispatch data. For formal reporting and analysis, the PFD uses data from both CAD and Firehouse<sup>®</sup>. In 2010, the PFD transitioned to the nationally standardized and mandated National Fire Incident Reporting System (NFIRS<sup>10</sup>), for the purpose of official fire response documentation, inclusive of response time information. The specific platform/application the Fire Department deploys to do NFIRS reporting is a product and service named FIREHOUSE Software<sup>®11</sup>. These reports are recognized as the most comprehensive and reliable source of response information. Data obtained from FIREHOUSE Software<sup>®</sup> is the source for reporting overall Fire Department response time performance.

<sup>9</sup> Eighty-two (82) of 100 completed Fire Cadet Training successfully.

<sup>10</sup> The National Fire Incident Reporting System (NFIRS) is a reporting standard that fire departments use to uniformly report on the full range of their activities, from fire to Emergency Medical Services (EMS) to equipment involved in the response. <https://www.usfa.fema.gov/data/nfirs/about/a>

<sup>11</sup> <http://www.firehousesoftware.com/products/fh/>

## PHILADELPHIA FIRE DEPARTMENT RESPONSE TO CONTROLLER'S SPECIAL AUDIT

Additionally, with regard to NFPA 1710, ISO indicates that applying the 5:20 performance objective to all fire department responses would be unsafe in incidents which by reported nature and condition<sup>12</sup> do not warrant a response that would risk the safety of firefighters and the public

*“...it would be inappropriate to incite fire service personnel to push fire apparatus beyond a safe driving speed for the sake of faster response times, especially since U.S. Fire Administration statistics for 2005 indicate that 17 percent of firefighter on-duty fatalities resulted from responding to alarms.”*

As presented in PFD Table I, when there is potential for loss of life and/or property at structure fires; the PFD reliably and consistently meets or exceeds NFPA 1710.

In summary:

- The current PFD leadership recognized in 2014 that firefighter turnout times for all non-structural assignments were in need of improvement and took measures to address them.
- This administration recognized the importance of reliably obtaining “on-scene” times from field units and implemented corrective measures.
- To reduce overtime expenditures, this administration requested and gained approval to hire approximately 300 new firefighters.
- Total response times to incidents where life and property are endangered have never fallen below NFPA 1710 standards.
- Turnout times across all fire suppression responses are continually improving.
- Travel times to all fire suppression responses have remained consistent.

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<sup>12</sup> Reported conditions as received and reported via the 911 dispatch system  
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PHILADELPHIA FIRE DEPARTMENT RESPONSE TO CONTROLLER'S SPECIAL AUDIT

Appendix A

**PHILADELPHIA FIRE DEPARTMENT**  
**HEADQUARTERS**

GENERAL MEMORANDUM #15-160

December 31, 2015

**TO** : All Officers and Members  
**REF/AUTHORITY** : Fire Commissioner  
**SUBJECT** : **SUSPENSION OF ROLLING BROWNOUTS POLICY**

At 2000 hours, December 24, 2015, Fire Commissioner Sawyer ordered the immediate suspension of the rolling brownouts policy, which was implemented in 2010.

**RESPONSIBILITY**

It will be the responsibility of each member to review this policy in its entirety and to exercise the appropriate control as dictated by his/her rank in the implementation of this General Memorandum.

**BY ORDER OF**  
**DERRICK J. V. SAWYER**  
**FIRE COMMISSIONER**

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PHILADELPHIA FIRE DEPARTMENT RESPONSE TO CONTROLLER'S SPECIAL AUDIT

Appendix B:

Car 2 Bulletin 14-02: Turnout Time



# Turnout Time

Page 1

**60 SECS**

**EMS**

(First Responders, BLS, and ALS Units)

**80 SECS**

**FIRE**

(Hooks, Gas Meters, etc.)

*Our neighbors, family, friends, and visitors expect rapid response from the Philadelphia Fire Department.* The initial, key component in a successful operational outcome is an optimal response time. As per the NFPA 1710 standard which addresses response time. One key components is Turnout Time. Turnout Time will be defined as the time interval that begins when a unit assigned to a Fire or EMS incident receives the emergency dispatch notification via the FCC CAD watch desk or MDT terminal, and acknowledges receipt of the alarm at the beginning of the unit's movement, then considered the beginning of Travel Time, via radio and/or MDT status change. The Department recognizes Turnout Time as a crucial component in the overall Response Time calculation. Effective immediately, Directive 42, Communications, Section 4.2.1, Operating Instructions – Acknowledgement / Field Response, will on the T Drive in the OPS Folder, be revised to read:

"PFD units will immediately verify receipt of an assignment at the time a unit is enroute to the assignment via radio and/or MDT. Turnout Time for Fire and Operational responses will be required within 80 seconds. Turnout Time for EMS responses will be required within 60 seconds. If units do not verify response within the required times, the FCC will attempt to contact them via radio and phone to ascertain receipt of the assignment.



Any delayed response will be reported to the on duty appropriate Chief Officer, Deputy 1, or Deputy 2, and ES3 on EMS responses."



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Chr 2 Bulletin 14-02, Turnout Time



# Turnout Time

Page 2

**60 SECS EMS**

**80 SECS FIRE**

Turnout and Travel time response records are comprehensively archived and monitored by the Department, via available CAD and GPS vehicle location data.

REMEMBER!!!

Turnout Time is the time from dispatch until the beginning of the unit's movement.

GPS  
Vehicle  
Location  
Data  
Example

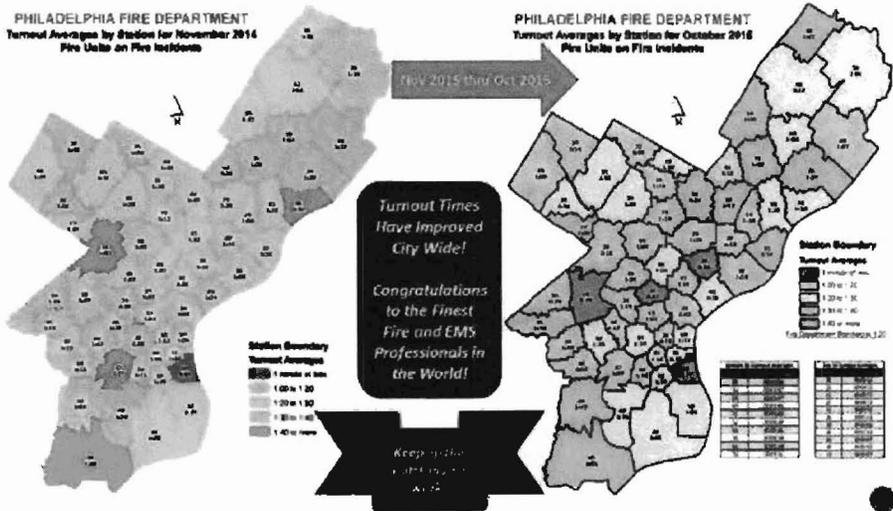




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PHILADELPHIA FIRE DEPARTMENT RESPONSE TO CONTROLLER'S SPECIAL AUDIT

Appendix C:



Turnout Time - Fire Runs  
(\*Nov 2014 thru Oct 2015)  
**Most Improved Battalions**

1. **Battalion 3**  
• 13 Second Improvement\*
2. **Battalion 7**  
• 13 Second Improvement\*
3. **Battalion 12**  
• 12 Second Improvement\*



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PHILADELPHIA FIRE DEPARTMENT RESPONSE TO CONTROLLER'S SPECIAL AUDIT

**Turnout Time - Fire Runs**  
(\*Nov 2014 thru Oct 2015)  
**Top 10 Stations**

|         |         |          |      |
|---------|---------|----------|------|
| 1. E.78 | 53 secs | 6. E.29  | 1:03 |
| 2. E.25 | 55 secs | 7. E.59  | 1:06 |
| 3. E.3  | 57 secs | 8. E.46  | 1:07 |
| 4. E.27 | 57 secs | 9. E.68  | 1:07 |
| 5. E.16 | 59 secs | 10. E.47 | 1:07 |



PHILADELPHIA FIRE DEPARTMENT RESPONSE TO CONTROLLER'S SPECIAL AUDIT

Appendix D

**PHILADELPHIA FIRE DEPARTMENT  
HEADQUARTERS**

GENERAL MEMORANDUM #14-77

July 16, 2014

**TO :** All Officers and Members  
**REF/AUTHORITY :** Deputy Commissioner Operations / Fire Commissioner  
**SUBJECT :** Radio & Mobile Data Terminal (MDT) Communications

To collect complete and accurate incident reporting documentation, members must utilize the status messaging capability on the apparatus MDT. MDT status messaging will be used in conjunction with voice radio transmissions, as indicated in: Directive 42, Fire Department Communications, Section 4.1.2. Members will specifically review Directive 42, Fire Department Communications, Section 4.6.7, Operating Instructions – MDTs.

Officers and members will be held accountable for adhering to this in-place operating procedure:

RESPONDING UNITS SHALL MAKE A VERBAL NOTIFICATION  
**AND**  
 PRESS THE APPROPRIATE STATUS BUTTON



WHEN:

1. ENROUTE (F3)
2. \*ARRIVING ON-LOCATION (F4)
3. TO HOSPITAL (F5)
4. \*\*AT HOSPITAL (F6)
5. BECOMING AVAILABLE (F8)
6. OFF RADIO AT STATION(F9)

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## PHILADELPHIA FIRE DEPARTMENT RESPONSE TO CONTROLLER'S SPECIAL AUDIT

Company Officers/ EMS Supervisors will conduct a station exercise on the above referenced communications procedure. EMS Field Supervisors will coordinate with Fire Company Officers to ensure that all ALS personnel receive training. Division 1 and 2 Chiefs and ES-1 will submit consolidated memos for their platoons documenting that training has been conducted as well as listing all members that attended. Memos will be sent electronically to the Fire Academy to the attention of Deputy Chief, Troy Gore. Memos are due by Monday, August 4, 2014. This training exercise will become part of each company's training record. The Fire Academy will follow up with Division Chiefs and ES-1 to identify and train any members who were unavailable.

Additionally, FCC will immediately begin to review CAD records for compliance. On each first day work, FCC will provide to Division 1, Division 2 and ES-1, randomly selected CAD incidents with missing "on scene" times from the previous tour. ES-1 and Division Chiefs will assign a designated officer to investigate, and report, via memorandum, as to the circumstances/reason for the omission. Memorandums will be completed and submitted by the end of the current working tour to the Deputy Commissioner of Operations, via the chain of command.

- **EMS INCIDENTS:** Unless circumstances require, no verbal contact is required for on scene status changes. The "OnScn" button will be used to document an on scene status (Dir #42, §4.6.7).
- **EMS INCIDENTS:** No verbal contact is needed for going off radio at the hospital. The "AtHosp" button will be used to document the status change (Dir #42, §4.6.7).

**DERRICK J. V. SAWYER**  
**FIRE COMMISSIONER**

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## PHILADELPHIA FIRE DEPARTMENT RESPONSE TO CONTROLLER'S SPECIAL AUDIT

## Appendix E:

PHILADELPHIA FIRE DEPARTMENT

DIRECTIVE #42  
DECEMBER, 2012SUBJECT: FIRE DEPARTMENT COMMUNICATIONS1. POLICY

To provide and insure the prompt reporting and accurate, rapid exchange of information between the Fire Communications Center (FCC) and field and/or staff units and between units themselves in accordance with Federal Communications Commission regulations. This includes the use of all the communications components of the Philadelphia Fire Department. They are the 800 MHz radio system, the mobile data terminals, and the CAD communications equipment at the watch desk. Unofficial use, use of profanity, or tampering with these systems shall result in immediate dismissal.

2. DEFINITIONS2.1 PFD COMMUNICATIONS SYSTEM AND COMPONENTS

- 2.1.1 800 MHz Radio System – City wide trunked radio system used by all City agencies. The system is comprised of an "A" system used by the Fire Department and other City agencies and a "B" system used by the Police Department.
- 2.1.2 Fire/EMS Mobile Radios – Permanently mounted radios in vehicles.
- 2.1.3 Fire/EMS Portable Radios – Motorola hand held radios.
- 2.1.4 Mobiles in a Tray – Mobile Radios and a power supply that have been placed in a tray mount. They have been placed at the station watch desks, Chief Officer's quarters, and in some staff offices.
- 2.1.5 Public Address System – Land line voice amplified public address system located at the watch desk area of all fire stations. The P.A. system has been synchronized with the 800 MHz radio system to allow for a simulcast dispatch over the P.A. and radio systems together.
- 2.1.6 Miscellaneous Portable Communications Devices – Blackberries, Cell Phones and Pagers.

PHILADELPHIA FIRE DEPARTMENT RESPONSE TO CONTROLLER'S SPECIAL AUDIT

**DIRECTIVE #42  
DECEMBER, 2012**

**2.5.4** MayDay - The radio transmission "MAYDAY - MAYDAY" is reserved ONLY to report a member who is in distress, lost, trapped, out of air, or down; when a collapse has occurred or is imminent; or where any other circumstance that can seriously injure or kill the firefighter is present. See O.P. #38, Rapid Intervention Team

**2.6 RESPONSE SPEEDS**

**2.6.1** Emergency Speed - Response speed with all warning devices in operation and in compliance with all the regulations dictated in Directive #26.

**2.6.2** Proceed In and Standby - Proceed in to the assignment at emergency speed, engine companies will obtain a hydrant, flush the hydrant (weather permitting), and have all members remain with the apparatus and await further orders. Ladder companies will respond to their assigned positions and stand-by to await further orders. Incident Command will notify the FCC immediately when additional companies go into service other than the first Engine and Ladder company.

**2.6.3** Reduced Speed - All warning devices will be turned off. Companies will proceed to their proper position at the location of the alarm obeying all traffic rules and regulations. Engine companies will obtain a hydrant and flush (weather permitting). Ladder companies will stand-by at their assigned position. Personnel will remain with their apparatus and await further orders.

**2.6.4** Standby - All warning devices will be turned off and companies will pull over to the side of the road and stop. Companies will await further orders via radio.

**Note:** When under "Proceed In and Standby", "Reduced Speed", and "Standby" responses, company officers are to be aware that unless the company goes into service, they are still considered available for dispatch to another location. The FCC can utilize these companies for dispatches in the area of the initial assignment. However, unless the Incident Commander has returned them; additional units will be dispatched to the initial alarm to cover for those withdrawn.

**2.7 CODE OF RESPONSE**

**2.7.1** Silent Alarm - No warning devices will be employed within the last three blocks unless fire or smoke is visible, in which case the FCC will be notified and emergency speed will be resumed. The FCC shall give the address and order emergency response speed for other companies responding.

**2.7.2** Local Alarm - A dictated response, below the level of a Tactical or Box alarm, made at emergency speed. Some examples are alarm system responses, fumes responses, accident responses, rubbish responses, and automobile responses.

PHILADELPHIA FIRE DEPARTMENT RESPONSE TO CONTROLLER'S SPECIAL AUDIT

**DIRECTIVE #42  
DECEMBER, 2012**

- 2.7.3 Tactical Box – A multiple unit response as dictated by Directive #39. It consist of 2 Engines, 2 Ladders, and 1 Battalion Chief.
- 2.7.4 Box Alarm – A multiple unit response as dictated by Directive #39. It consist of 4 Engines, 2 Ladders, and 2 Battalion Chiefs.
- 2.7.5 Investigation - A single unit response at reduced speed as dictated by Directive #39.
- 2.7.6 Limited Response – Unit(s) dispatched to a school or prison facility to investigate a fire that has been extinguished by facility personnel. Units will respond at reduced speed.
- 2.7.7 Silent Alarm Assist Police / Hazmat Limited Response – HMTF dispatched to addresses where prior known intelligence has been established by law enforcement. This is primarily a reduced speed response but the HMTF can opt to use emergency speed if conditions warrant such response.

**2.8 TERMINOLOGY**

- 2.8.1 Incident Command System (ICS) – A management tool that provides continuity of command from arrival of the first company through the conclusion of the incident. The Philadelphia Fire Department utilizes the ICS and as such will communicate using the procedures and terminology dictated by O.P. #19.
- 2.8.2 Incident Commander (IC) or "Command" – The person in charge of the emergency or planned event. The IC is responsible for the command function at all times. As the identity of the IC changes through transfers of command, this responsibility shifts with the title.
- 2.8.3 Officer – This term will be used by the Officer/Acting Officer-in charge of a company to indicate the identity of the person transmitting a radio message. Example: "E16 Officer", "L4 Officer", etc.
- 2.8.4 Phonetic Alphabet – The following phonetic alphabet will be used by FCC personnel to avoid any confusion when announcing street names or apartment numbers with like sounding letters.

|             |              |             |             |
|-------------|--------------|-------------|-------------|
| A = Alpha   | H = Hotel    | O = Oscar   | V = Victor  |
| B = Bravo   | I = India    | P = Papa    | W = Whiskey |
| C = Charlie | J = Juliet   | Q = Quebec  | X = X-Ray   |
| D = Delta   | K = Kilo     | R = Romeo   | Y = Yankee  |
| E = Echo    | L = Lima     | S = Sierra  | Z = Zulu    |
| F = Foxtrot | M = Mike     | T = Tango   |             |
| G = Golf    | N = November | U = Uniform |             |

PHILADELPHIA FIRE DEPARTMENT RESPONSE TO CONTROLLER'S SPECIAL AUDIT

**DIRECTIVE #42  
DECEMBER, 2012**

- 4.2.3 All PFD Units that are "Available on Radio" are required to verbally acknowledge receipt of the dispatch. If the alarm is a Box or Tactical Box, FCC will remind the units of their position on the assignment, (1st In, 2<sup>nd</sup> In, 3<sup>rd</sup> In, etc.) Unless ordered to do otherwise by the Incident Commander, the companies position on the fire ground is determined by their position on the Box.
- |   |  |
|---|--|
| 1 <sup>st</sup> & 3 <sup>rd</sup> Due Engine to the Front | 2 <sup>nd</sup> & 4 <sup>th</sup> Due Engine to the Rear |
| 1 <sup>st</sup> Due Ladder to the Front                   | 2 <sup>nd</sup> Due Ladder to the Rear                   |
| 1 <sup>st</sup> Due BC to the Front                       | 2 <sup>nd</sup> Due BC to the Rear                       |
- 4.2.4 Acknowledgement of response, when required by units responding from the same station should be made by the Engine Company. The company will acknowledge response only for units that are responding from the station.
- 4.2.5 On all Box and Tactical Box assignments, the first due Engine, Ladder, and Battalion Chief must verbally acknowledge their response on the Box as well as verbally announce their arrival at the incident scene. All other units will use their MDT to send an enroute and on scene message to CAD.
- 4.2.6 Units delayed while responding for any reason will immediately notify the dispatcher.
- 4.2.7 Careful attention will be directed to radio transmissions while responding to an alarm for orders relative to that alarm. When a company gives a report from the fireground, the dispatcher will not ask the Chief Officer to acknowledge receipt. If the Chief Officer requests repeat of a report, the dispatcher will repeat the report from the company for the Chief Officer. When orders are transmitted from the fireground to other units, those units will acknowledge receipt of same.
- a. Where possible, Chief Officers will personally or through the fireground communications unit issue orders and instructions to companies responding to, or operating at an alarm, as to their deployment or required actions. Any unit may issue orders when necessary to perform their particular operations. Unit to unit transmission of orders and information is permitted on fireground when feasible. When fireground communications to an apparatus by an officer or member of a company who is removed from their apparatus is desired, the following shall apply. Example: "Engine 45 Officer to Engine 45 DPOP, give me the water, shut down." etc.
  - b. When it is necessary to use a radio talk group other than assigned area talk group to contact "Radio", switch to the other band and transmit unit identification: acknowledgment must be received before proceeding with transmission.
- 4.2.8 When the first-in officer reports "Nothing Showing," all other companies will automatically "Reduce Speed" with the exception of responses to hospitals, nursing

## PHILADELPHIA FIRE DEPARTMENT RESPONSE TO CONTROLLER'S SPECIAL AUDIT

**DIRECTIVE #42  
DECEMBER, 2012**

homes, and high rise boxes where companies will "Proceed In and Stand-By;"

- 4.2.9 When a unit arrives on location, and after giving a report does not give orders for responding companies, the dispatcher will put companies on "Proceed In and stand-By status."

**4.3 OPERATING INSTRUCTIONS – FIREGROUND COMMUNICATIONS**

- 4.3.1 First arriving unit will announce their arrival at the assignment immediately, giving specific location and conditions as observed. Then, upon completion of investigation, notify the dispatcher within five (5) minutes giving a full report as prescribed by the Report of Fireground Conditions form. Thereafter, the Incident Commander on the fireground shall report conditions every ten (10) minutes on the hour until the fire is placed under control. If the incident is "False," or minor in nature, such as "Auto on Highway," "Rubbish," etc., so state. If there is no indication for cause of alarm, or no evidence of fire, the first arriving officer may have companies go to "Standby" status. The FCC will monitor time segments and request progress reports when indicated. If an incident is not placed under control within one hour of dispatch, the "On Call" Deputy Commissioner will be notified.
- 4.3.2 Preliminary reports from the fireground shall be transmitted promptly and contain all required information. Telephone reports may be used in lieu of the radio where more efficient and expedient. Officers who have to use a telephone are to use the following number: (215) 686-1340, 41 (FCC Supervisor)
- 4.3.3 The first arriving engine company, the first arriving ladder company, all Chief Officers, medic units, and special apparatus will inform the dispatcher of their arrival on scene and their departure from a fire or emergency scene. In instances where multiple units are arriving simultaneously, the first arriving unit will report location, nature and conditions, and will also announce the units arriving on the scene of the incident.
- 4.3.4 The FCC will not automatically cover up the 2<sup>nd</sup> due Battalion Chief on a full Box assignment. If only one Chief is responding, the FCC will notify the Chief that he/she is the only Chief on the Box. If subsequent 911 calls, or a report from the fire ground indicate a working fire, the FCC will dispatch a 2<sup>nd</sup> Battalion Chief.
- 4.3.5 It is the responsibility of the 1<sup>st</sup> In Battalion Chief, through his Aide, to establish and maintain communications with the FCC. If required, the 2<sup>nd</sup> In Battalion Chief's Aide will assist the 1<sup>st</sup> In Chief's Aide with the tasks and duties required for fireground communications.
- 4.3.6 Apparatus serving as communications will display their warning lights for the purposes of ready identification. All other apparatus on the fireground will switch off their warning lights

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\*APPENDIX F

Analysis for Dispatches with Engines on Listed Initial Dispatch Types

| Year | Single Engine Dispatches | Multi Unit Dispatches | Total  | Initial Dispatch Types |
|------|--------------------------|-----------------------|--------|------------------------|
| 2010 | 27,952                   | 6,877                 | 34,829 | ACC                    |
| 2011 | 30,097                   | 6,558                 | 36,655 | ACCX                   |
| 2012 | 28,315                   | 6,216                 | 34,531 | ALARM                  |
| 2013 | 27,799                   | 6,805                 | 34,604 | APL                    |
| 2014 | 29,918                   | 7,874                 | 37,792 | APT                    |
| 2015 | 30,827                   | 7,915                 | 38,742 | AUTO                   |
|      | <b>174,908</b>           | <b>42,245</b>         |        | BLDG                   |
|      |                          |                       |        | BOX                    |
|      |                          |                       |        | BOXCAR                 |
|      |                          |                       |        | BRIDGE                 |
|      |                          |                       |        | BRUSH                  |
|      |                          |                       |        | CHIM                   |
|      |                          |                       |        | COINV                  |
|      |                          |                       |        | CSR                    |
|      |                          |                       |        | DOMACC                 |
|      |                          |                       |        | DUMPST                 |
|      |                          |                       |        | DWG                    |
|      |                          |                       |        | EXPLOS                 |
|      |                          |                       |        | FIRX                   |
|      |                          |                       |        | FUMES                  |
|      |                          |                       |        | GARAGE                 |
|      |                          |                       |        | GRASS                  |
|      |                          |                       |        | HAZMAT                 |
|      |                          |                       |        | HEATER                 |
|      |                          |                       |        | HIRI                   |
|      |                          |                       |        | INC                    |
|      |                          |                       |        | INDACC                 |
|      |                          |                       |        | IW/BLD                 |
|      |                          |                       |        | IW/DWG                 |
|      |                          |                       |        | LEAVES                 |
|      |                          |                       |        | MAIL                   |
|      |                          |                       |        | MIRA                   |
|      |                          |                       |        | NEA                    |
|      |                          |                       |        | NEA/B                  |
|      |                          |                       |        | PIA                    |
|      |                          |                       |        | PIA/B                  |
|      |                          |                       |        | PIA/L                  |
|      |                          |                       |        | PIER                   |
|      |                          |                       |        | REFINE                 |
|      |                          |                       |        | RELCIV                 |
|      |                          |                       |        | RIVER                  |
|      |                          |                       |        | ROT                    |
|      |                          |                       |        | RUB                    |
|      |                          |                       |        | SCHOOL                 |
|      |                          |                       |        | SIGN                   |
|      |                          |                       |        | STORE                  |
|      |                          |                       |        | STOVE                  |
|      |                          |                       |        | SUBWAY                 |
|      |                          |                       |        | TANKER                 |
|      |                          |                       |        | TRAIN                  |
|      |                          |                       |        | TREE                   |
|      |                          |                       |        | TRUCK                  |
|      |                          |                       |        | TUNNEL                 |

Note: From FireHouse Database

Must have at least one arriving Engine

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\*Appendix G includes NFPA 1710 and non-NFPA 1710 responses

APPENDIX G

NFIRS INCIDENT TYPE CODE BREAKDOWN FOR INCIDENTS OF CAD INITIAL TYPE ALARM SYSTEM

| Incident Type Code                     | Count   | Percentage |
|--|---------|------------|
| Unidentified*                          | 49      | 0.0%       |
| NFPA 1710 Fire Suppression             | 2,292   | 1.9%       |
| Rupture, Explosion, Overheat (No Fire) | 127     | 0.1%       |
| EMS Incident                           | 195     | 0.2%       |
| Hazardous Condition (No Fire)          | 1,772   | 1.5%       |
| Service Call                           | 2,083   | 1.7%       |
| Good Intent Call                       | 3,458   | 2.9%       |
| Malfunction, Unintentional, False      | 109,740 | 91.6%      |
| Severe Weather & Natural Disaster      | 18      | 0.0%       |
| Special Incident Type                  | 100     | 0.1%       |

**119,834**

\*Note: The Philadelphia Fire Department has until July 1, 2016 to finalize incidents reports for FEMA for CY2015.

YEARLY BREAKDOWN FOR NFIRS INCIDENTS OF CAD INITIAL TYPE ALARM SYSTEM

| Year | Count  |
|------|--------|
| 2010 | 18,670 |
| 2011 | 20,034 |
| 2012 | 18,605 |
| 2013 | 19,637 |
| 2014 | 21,071 |
| 2015 | 21,817 |

**119,834**

PHILADELPHIA FIRE DEPARTMENT RESPONSE TO CONTROLLER'S SPECIAL AUDIT

APPENDIX H

| <b>Fire Fatalities/Structure Fires Philadelphia 2010 -2015</b> |     |
|--|-----|
| Structure Fires (Tactical/Box Responses)                       | 154 |
| Other Fires  | 4   |
| Total  | 158 |
| Percentage   | 97% |

*Government Auditing Standards* require auditors to report instances where the auditee's comments to the auditor's findings, conclusions, or recommendations are not, in the auditor's opinion, valid or do not address the recommendations. We believe this to be the case with certain statements made in the PFD response regarding the:

- applicability of the national standard for fire response;
- consequences of its forced rotation policy for firefighters;
- overtime costs; and,
- source of data the Controller's Office used to compute response times.

### Applicability of NFPA 1710

In its response, the PFD has suggested that meeting the NFPA 1710 standard is only important for selected types of structure fires and that for these incidents it exceeds the standard. Our audit work suggests the PFD's interpretation of NFPA 1710 is misguided. As noted on page 7 of the report, in response to direct inquiries we made of the NFPA regarding the types of fire incidents covered by NFPA 1710, the NFPA responded that the standard of response applies to any incident where a fire apparatus (fire engine) is responding. Moreover, according to NFPA 1710, "This standard applies to the deployment of resources by a fire department to emergency situations when operations can be implemented to save lives and property."<sup>1</sup> An "emergency incident" as defined by NFPA 1710 is "any situation to which an emergency services organization responds to deliver emergency services including rescue, fire suppression, emergency medical care, special operations, law enforcement, and other forms of hazard control and mitigation."<sup>2</sup> "Special Operations" as defined by NFPA 1710 are, "Those emergency incidents to which the fire department responds that require specific and advanced training and specialized tools and equipment."<sup>3</sup>

### Consequences of Fire Department's Forced Rotation Policy for Firefighters

On page 37, the PFD responded that "turnout time" increased since rotations occurred. We did not report turnout times increased in that section of the report. The Controller's Office reported travel times increased since the rotation policy had been implemented.

### Overtime Costs

In its response on page 39, the PFD inappropriately used total uniform (firefighters and emergency medical technicians) overtime costs and staffing levels rather than just firefighters. The Controller's Office reported overtime costs and staffing levels for only firefighters.

### Source of Data Used to Compute Response Times

In its response, the PFD stated that the Controller's Office utilized only CAD data instead of data from both the CAD and its Firehouse software. We believe that CAD data represents the most accurate and official data regarding fire emergencies, as it is recorded in real-time. As discussed at the exit conference, Firehouse data is automatically downloaded from the CAD. When entries in the CAD are missing, the Firehouse software allows firefighter officers to manually enter estimated times. These estimated times could be impacted by memory lapses or biases of the officers, data entry errors, or manipulation as a result of pressure exerted by management.

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<sup>1</sup> NFPA 1710, §1.3.1 (Application)

<sup>2</sup> NFPA 1710 §3.3.16 (General Definitions)

<sup>3</sup> NFPA 1710 §3.3.41.1 (General Definitions)

## **CONTROLLER'S OFFICE CONTACT AND STAFF ACKNOWLEDGEMENTS**

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### **Staff Acknowledgements**

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